JVC

SERVICE MANUAL

Hi-Fi STEREO VIDEO CASSETTE RECORDER VHS

HR-D830E/EG

HQ

VPT-TOP TELETEXT PROGRAMMING

Digital AV Tracking

SPECIFICATIONS

GENERAL

Power requirement	: 220 V∿, 50/60 Hz
Power consumption	: 35 W
Temperature	: 5°C to 40°C (Operating) -20°C to 60°C (Storage)
Operating position	: Horizontal only
Dimensions (WxHxD)	: 435 x 95 x 332 mm
Weight	: 5.6 kg
Tape format	: VHS PAL standard
Tape width	: 12.65 mm
Tape speed (SP)	: 23.39 mm/sec
(LP)	: 11.70 mm/sec (Hi-Fi audio only)
Maximum recording time (SP)	: 240 min. with E-240 video cassette
(LP)	: 480 min. with E-240 video cassette (Hi-Fi audio only)

VIDEO

Signal system	: PAL colour and CCIR monochrome signals, 625 lines/50 fields
Recording system	: Rotary two-head helical scan system with a slant double-azimuth combination video head
Input	: 0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output	: 1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio	: 43 dB (Rohde & Schwarz noise meter) with picture sharpness control at centre position
Horizontal resolution	: 250 lines with picture sharpness control at centre position

AUDIO

Recording system	: Longitudinal track
Input	: Mic: -67 dBs, high impedance, unbalanced : AUDIO EING. connector (RCA x 2): -8 dBs, 50 k-ohms, unbalanced : AUDIO/VIDEO socket (21-pin Peri connector): -3.8 dBs (CENELEC standard), 10 k-ohms, unbalanced
Output	: AUDIO/VIDEO socket (21-pin Peri connector): -3.8 dBs (CENELEC standard), high impedance load : AUDIO AUSG. connector (RCA x 2): -6 dBs, high impedance load, less than 1 k-ohm, unbalanced (100 k-ohms, load)

Hi-Fi AUDIO

Recording system	: Deep-layer recording system conforming to stereo Hi-Fi VHS standard
No. of audio channels	: 2 Hi-Fi audio channels 1 normal audio channel
Frequency response	: 20 Hz to 20,000 Hz
Dynamic range	: More than 90 dB
Wow and flutter	: Less than 0.005 % WRMS

TUNER

Tuning system	: Frequency synthesized tuner
TV channel storage capacity	: 48 positions (+ AUX position "AU")
Channel coverage	: VHF 47 – 111 MHz 111 – 300 MHz UHF 470 – 862 MHz
Aerial output	: UHF channel 36 (adjustable 32 – 40)

TIMER

Clock reference	: Quartz-crystal
Programme capacity	: 1-year/8-programme timer
Memory back-up time	: 3 – 5 min.

ACCESSORIES

Provided accessories	: Aerial cable, Infrared remote control unit, "R6" battery x 2 Audio cable (RCA-RCA)
Optional accessories	: VPV adapter VU-V120E VPT adapter VU-V140E

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

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No. 82124
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NOTE: For a technical description, please refer to Technical Guide VTG82041 HR-D830 PAL.

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● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

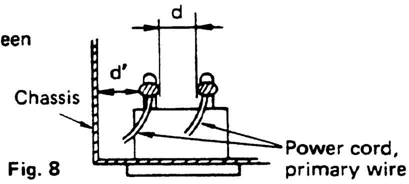


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method: (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

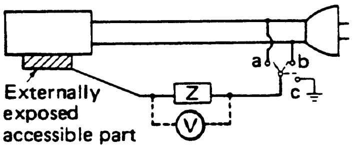


Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

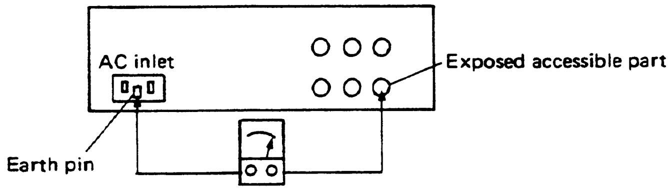


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

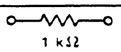
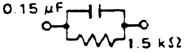
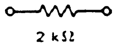
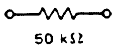
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	 1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	 0.15 μF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	 2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		 50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

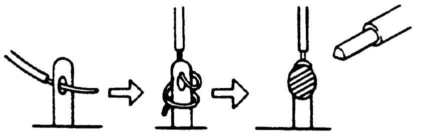


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

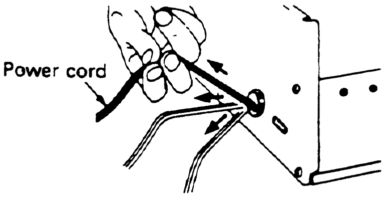


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number :** E03830-001
    2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

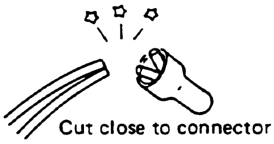


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

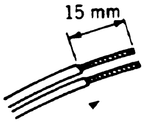


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

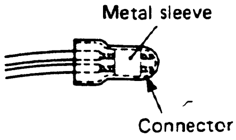


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

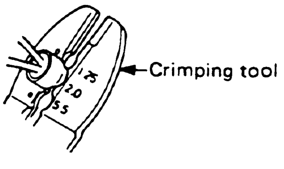


Fig. 6

(5) Check the four points noted in Fig. 7.

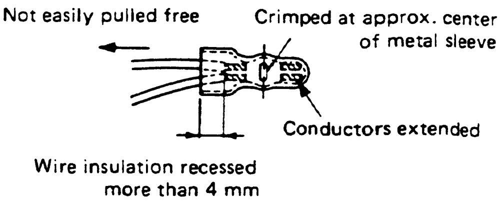

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

JVC

BEDIENUNGSANLEITUNG

HR-D830EG

Hi-Fi STEREO-VIDEOCASSETTENRECORDER

INSTRUCTIONS: Hi-Fi STEREO VIDEO CASSETTE RECORDER

Digital AV Tracking VPT-TOP TELETEXT PROGRAMMING HQ

VHS PAL

PU30425-1059

SAFETY PRECAUTIONS

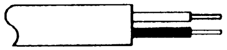
The rating plate and the safety caution are on the rear of the unit.

WARNING – DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT (In the United Kingdom)
Mains Supply (240 V∿, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with the following code:



If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt – consult a competent electrician.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

Omkopplaren BETRIEB på denna apparat är sekundärt kopplad och skiljer inte apparaten från nätet i läge BETRIEB OFF.

The BETRIEB button does not completely shut off mains power from the unit, but switches operating current on and off.

BEMAERK: I stilling OFF er apparatet stadig forbundet med lysnettet Hvis det ønskes fuldstændig afbrudt skai netledningen trækkes ud.

This unit is produced to comply with Directive 82/499/EEC, CISPR Pub. 13 and Pub. 14 and Standard IEC 65.

Video tapes recorded with this video recorder in the LP (Long Play) mode cannot be played back on a single-speed video recorder.

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VHS PAL HQ

- Only cassettes marked "VHS" can be used with this video cassette recorder.
- HQ VHS is compatible with existing VHS equipment.

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FEATURES

High-quality pictures

- **HQ (High Quality) System technologies** with DE (Detail Enhancer), and WCL (20 % higher white clip level).
- **Digital AV Tracking** for constantly maintaining the best possible Hi-Fi audio and video tracking: provides optimum pictures from most recorded tapes. Especially useful with rental software. Manual override is also possible.
- Picture sharpness control.

High-quality sound.

- **Hi-Fi VHS Stereo sound with dynamic range of more than 90 dB.**
- **Hi-Fi audio Long Play** mode for up to 8 hours of Hi-Fi stereo sound recording and playback with a single cassette.
- **Hi-Fi recording level control** with ALC switch.

Special-effects playback

- **Double-Azimuth 3-head (DA-3) system for noiseless stills** and frame advance.
- **Variable-speed noiseless slow motion** at 1/6, 1/12, 1/18, 1/24 and 1/30 normal speed.
- **Variable-speed search** at 3, 5, and 9 times normal speed in both directions.
- **Double-speed forward playback and normal-speed reverse playback.**

Programming features

- **VPT/VPS compatibility** (optional adapter required for VPT).
  - Compatible with TOP Teletext system.
  - Teletext timer programming with on-screen title display.
  - Teletext viewing with multiple page access capabilities.
  - Colour on-screen display for timer programming and teletext page setting.
  - Four coloured keys on remote control for easy Teletext operation.
- **LCD remote programming** by data transfer.

Remote control features

- **Full control over Teletext operations.**
- **Independent timer programming with built-in LCD and 4 programme memories.**
- **Direct access to VCR's timer programmes** for checking and cancelling.
- **Built-in clock:** clock setting can be transferred to the VCR clock.
- **10-Digit keypad** for timer programming, channel selection, Index Search, Go-To, and Time Search functions.
- **TV control** for power on/off, volume, channel and AV mode selection (designated TVs only).
- **Duet Editing system** for controlling two JVC decks simultaneously — one for playback and one for recording — for simplified editing operation.
- **Instant A/B code switching** with indicator on LCD for controlling two JVC decks independently from a single remote control.
- Tape eject, counter reset, and Index Mark/Erase buttons provided.

Tuner features

- **PLL frequency synthesized wide-band cable tuner** with 48-channel storage capacity.
- **Pretuned to European television broadcast frequencies:** VHF, UHF and cable channels.
- **10-Key random-access remote channel selection** and up/down channel scanning.
- **Sound-Multiplex capability** for reception and recording of stereo and bilingual broadcast programmes.

Timer features

- **1-Year/8-event programmable timer.**
- **24-Hour instant timer** for quick setting to record a programme which starts within 24 hours.
- One-button instant timer recording.
- Memory backup for a short power outage.
- **Instant "summer time" adjustment** for making annual clock adjustment to or from daylight saving time a single-touch operation.

Tape access features

- **VHS Index Search System** which automatically places index codes at the beginning of any recording, with **mark/erase facilities** for manual marking of extra codes, or erasing of unnecessary codes.
- **Automatic location of up to 99 coded programmes** by remote-specifying the number of index codes to be skipped.
- **Intro Search** to play back the beginning of each indexed programme for about 5 seconds in fast-motion.
- **Realtime Go-To function** for locating a point on tape a specified time away from the beginning.
- **Realtime Search function** for locating a point on tape a specified time away from the current position in either direction.
- **Half-loading mechanism for quick tape access:** Index and Intro Search, and Realtime Go-To and Search can all be carried out in the Rewind and Fast-Forward modes at up to 60 times normal speed as well as in the Shuttle Search mode.
- Counter memory function for returning to a designated point on tape.
- **Shuttle Search** with lock function at 9 times normal speed.

Other value features

- **Realtime tape counter** showing tape time in hours, minutes and seconds by counting the recorded 25-Hz control signal pulses.
- **Audio dubbing** to dub a new soundtrack on the normal audio track without affecting the Hi-Fi or video tracks.
- **Child Lock system** for making the recorder's operation buttons ineffective; preventing accidental operation by young children, or other unwanted operation.
- **Automatic backspace editing by Zero Frame Editing system** for clean assemble edits.
- **Automatic functions** including Auto Play, Next-Function Memory, and more.
- **On-screen record-pause mode display** showing elapsed pause time.
- Pause remote control connector for VideoMovie's Master Edit Control system.
- Switchable AC outlet.

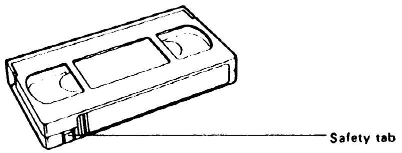
PRECAUTIONS

Handling and storage

- Avoid using the recorder under the following conditions:
  - extremely hot, cold or humid places,
  - dusty places,
  - near appliances generating strong magnetic fields,
  - places subject to vibrations, and
  - poorly ventilated places.
- Be careful of moisture condensation.
- Avoid using the recorder immediately after moving from a cold place to a warm place. The water vapour in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully
  - Do not block the ventilation openings.
  - Do not place anything heavy on the recorder.
  - Do not place anything which might spill and cause trouble on the top cover of the recorder.
  - Use in horizontal (flat) position only.
- In case of transportation,
  - Avoid violent shocks to the recorder during packing and transportation.
  - Before packing, be sure to remove the cassette from the recorder.

Video cassettes

- This recorder employs VHS-type cassettes only.
  E-240 for 4 hours/8 hours, E-180 for 3 hours/6 hours, E-120 for 2 hours/4 hours, E-90 for 1 hour and 30 minutes/3 hours, E-60 for 1 hour/2 hours and E-30 for 30 minutes/1 hour of recording.
  The recording time of each cassette can be doubled if you use the LP (Long Play) mode for recording Hi-Fi audio only.
- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

Moisture condensation

- If you pour a cold liquid into a glass, water vapour in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation [illegible] drum, one of the most crucial parts of the video [illegible], will cause damage to the tape.
- Moisture condensation is apt to occur under the following conditions:
  - when the recorder is moved from a cold place to a warm place, and
  - under extremely humid conditions.
- In conditions where moisture condensation may occur, keep the power cord plugged in an AC outlet and the power switched on; this will help prevent condensation from occurring. When condensation has occurred, it will not evaporate quickly once the power is switched on. Wait a few hours for the recorder to become dry.

Operation

- When a cassette is loaded, the power is switched on automatically.
- The cassette can be unloaded even when the power is off. Pressing the ■ / ⏏ button turns the power on and, after ejection of the cassette, shuts it off automatically in this case.
- As long as the SCHALTUHR button is engaged with the TIMER indicator lit, the BETRIEB and ■ / ⏏ buttons have no effect and unloading of a cassette is not possible. If a cassette has not yet been inserted, simply insert a cassette; the power will be switched on to load the cassette properly and, after completion of automatic loading, the Timer Recording Standby mode will be engaged with power off.

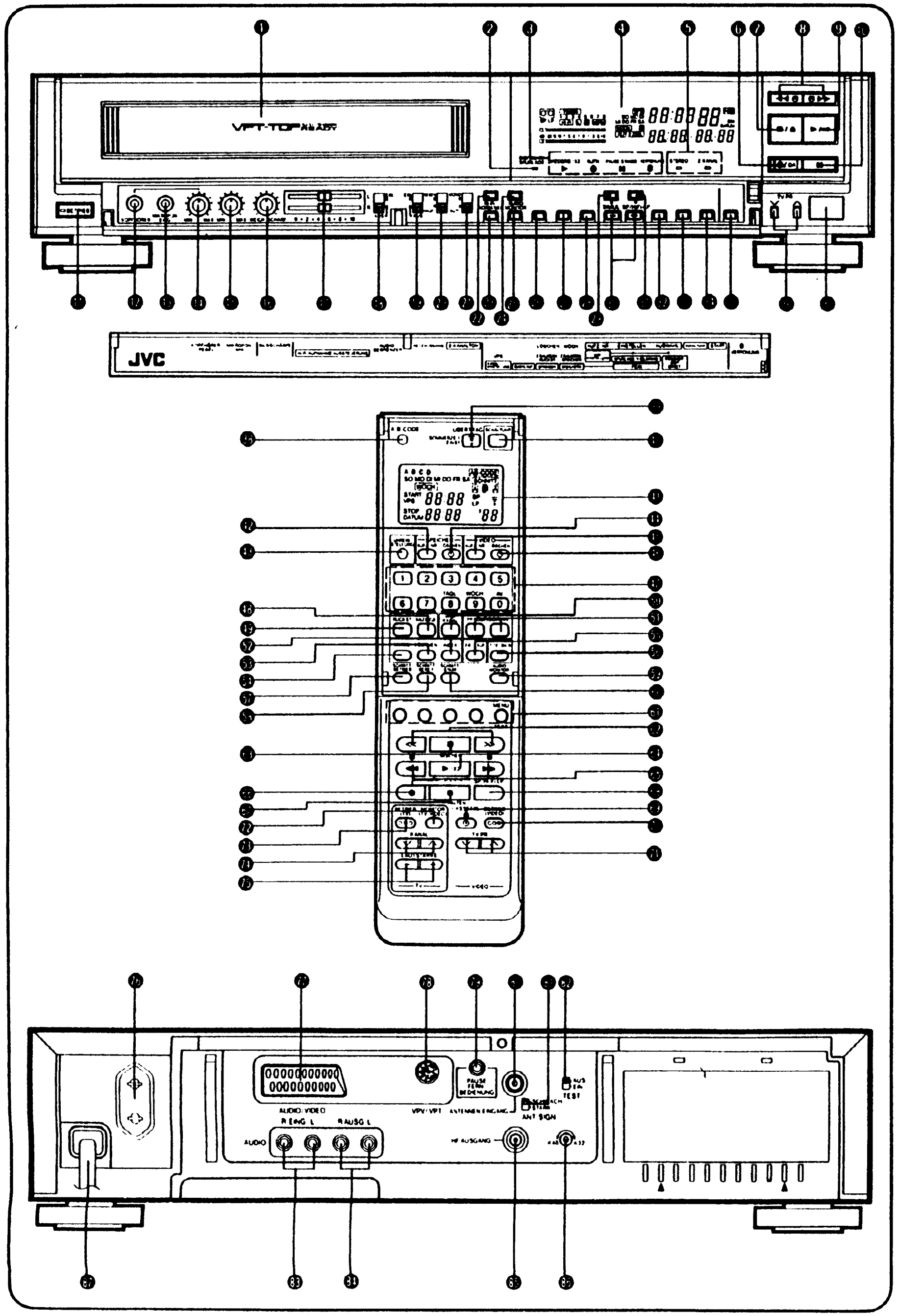
Remote control unit

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

WARNING

There are two different types of SECAM colour systems: SECAM-L, used in FRANCE (also called SECAM-West), and SECAM-B, used in the GDR, e.g. (also called SECAM-East).

1. This recorder can also receive SECAM-B colour television signals for recording and playback.
2. Recordings made of SECAM-B television signals produce monochrome pictures if played back on a video recorder of SECAM-L standard, or do not produce normal colour pictures if played back on a PAL video recorder with SECAM-B system incorporated (even if the TV set is SECAM-compatible).
3. SECAM-L prerecorded cassettes or recordings made with a SECAM-L video recorder produce monochrome pictures when played back with this recorder.
4. This recorder cannot be used for the SECAM-L standard. Use a SECAM-L recorder to record SECAM-L signals.


VPT-TOP READY
JVC

CONTROLS, INDICATORS AND CONNECTORS

Refer to diagrams on the front foldout page.

Front Panel

① **Cassette loading slot**
Insert a VHS cassette. The door will close and the "cassette loaded" indicator will appear on the FDP (fluorescent display panel).

② **Digital AV tracking indicator (DIGITAL-AV-SPURLAGE)**
Lights in the Digital AV Tracking mode.
Blinks when adjusting.

③ **Mode indicators**

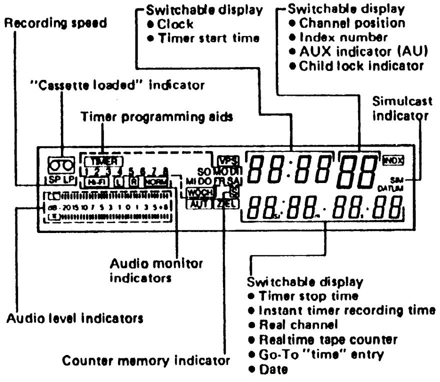
WIEDERG./X2: Lights in the Play or Double-Speed Play mode. also lights in the Record mode together with the AUFN. indicator.

AUFN.: Lights in the Record mode together with the WIEDERG./X2 indicator.

PAUSE/ STANDB.: Lights in the Still or Record-Pause mode.

VERTONUNG: Lights in the Audio Dubbing mode.

④ **Fluorescent Display Panel (FDP)**


Recording speed
Switchable display
● Clock
● Timer start time
Switchable display
● Channel position
● Index number
● AUX indicator (AU)
● Child lock indicator
"Cassette loaded" indicator
Timer programming aids
Simulcast indicator
TIMER
1 2 3 4 5 6 7 8
SP LP
Hi-Fi
L
R
NORM
VPS
SO MO DI
MI DO FR SA
WOCH
AUT
ZIEL
INDX
SIM
DATUM
88:88 88
88:88 88:88
dB -20 15 10 7 5 3 1 0 1 3 5 +8
Audio monitor indicators
Audio level indicators
Counter memory indicator
Switchable display
● Timer stop time
● Instant timer recording time
● Real channel
● Realtime tape counter
● Go-To "time" entry
● Date

⑤ **LED indicators**

STEREO: Lights when a stereo programme is being received.

2-KANAL: Lights when a bilingual programme is being received.

⑥ **Record/Instant Timer Record button (● /DA)**
- Press once to start recording.
- Press twice to engage the Instant Timer Recording mode.

⑦ **Stop/Eject button (■ / ⏏)**
- Press while in the Stop mode to eject the cassette.
- Press while in other modes to stop the tape.

⑧ **Rewind/Fast-Forward/Shuttle Search buttons (◀◀ / ▶▶)**
- Press while in the Stop mode to rewind or fast-forward the tape.
- Press while in the Play mode for Shuttle Search in the reverse or forward direction.

⑨ **Play/X2 button (▶ /X2)**
- Press to play back a tape.
- Press twice for double-speed playback.
- Also press to cancel the Pause/Still, Shuttle Search or Double-Speed mode.

⑩ **Pause/Still button (❚❚)**
- Press while in the Record mode to stop the tape temporarily to avoid recording of unwanted material.
- Press while in the Play mode to view a still picture.
- The still picture can be advanced each time this button is pressed.

⑪ **Operate button (BETRIEB) with LED indicator**
Press to apply operating power to the recorder. Loading a cassette also turns the power on.

⑫ **Headphone jack (KOPFHÖRER)**

⑬ **Microphone jack (MIKROFON-EING.)**

⑭ **Phones level control (KOPFHÖRER-PEGEL)**
Ajusts the level of audio output from the headphone jack.

⑮ **Microphone mix-level control (MIKROFON-MIX)**
For control of the microphone input level for microphone-mix recording via the MIKROFON-EING. jack ⑬ . When making an adjustment, connect a pair of headphones to monitor the input level.

⑯ **Picture sharpness control (BILDSCHÄRFE)**
Turn this knob clockwise to make the picture sharper. Turn counterclockwise to give the picture a softer tone. Effective only for playback pictures. (no effect on recording.)

⑰ **Hi-Fi audio recording level controls (Hi-Fi AUFNAHME AUSSTEUERUNG)**
Use to adjust the hi-fi audio recording level, referring to the audio level indicators on the FDP. See page 43.

⑱ **Automatic level control switch (AUDIO-BEGRENZER)**
Set to AUS when adjusting the hi-fi audio recording level manually.

⑲ **AC online switch (NETZAUSGANG)**

AUS position: Power is available from the rear panel AC output regardless of whether the recorder is on or off.

EIN position: Power is available from the rear panel AC outlet only when the recorder is on. When used in combination with the built-in timer, this enables timer-controlled power supply for the connected equipment.

⑳ **Tuner sound select switch (2-KANALTON)**

HAUPT: To record the main soundtrack (local language).

NEBEN: To record the sub soundtrack (foreign language).

(See pages 42 and 52.)

㉑ **Stereo/monaural switch (MONO/AUTO)**
Set to MONO when the quality of the stereo sound being received is poor. The broadcast will be received in monaural with improved results. (See page 52.)

㉒ **Hi-Fi/NORM/MIX button**
Press to select for listening among either hi-fi or normal soundtracks or a mixture of the two. (See page 44.)

㉓ **VPS/channel set button (KANAL-EINSTELLUNG)**
- Press to engage the Real Channel mode.
- Press to enter the VPS command while in the Timer Set mode.

㉔ **AUDIO MONITOR button**
Press to select the audio output. Each time the button is pressed, the soundtrack to be output changes: left and right (stereo), left or right. (See page 44.)

㉕ **Search button (SUCHLAUF)**
Press to initiate real channel automatic scan tuning. (See page 48.)

㉖ **Cancel/Counter reset/Skip button (LÖSCHEN/ZÄHLWERK-RÜCKST./SPRINGEN)**
This is a triple-function button:
- as a LÖSCHEN button – press to cancel the programmed data in the Timer Set mode.
- as a ZÄHLWERK-RÜCKST. button – press to reset the realtime counter reading to "0St 00M 00S".
- as a SPRINGEN button – press to skip unnecessary channels in the Real Channel mode.

● **Repeat/Counter memory/Store button**
(WÖCH[illegible]WERK-SPEICHER/SPEICHERN)
This is a [illegible] button:
- as a WÖ[illegible]tton – press to enter the repeat command in the Timer Set mode.
- as a ZÄHLWERK-SPEICHER button – press to engage the Counter Memory mode, "S" will appear on the FDP and the tape will stop automatically at the counter reading of "0St 00M 00S" when rewinding or fast-forwarding.
- as a SPEICHERN button – press to store the tuned-in channel in the Real Channel mode.

● **Programme/Clock adjust button**
(AUFZ. NR./UHREINSTELLUNG)
Press to change the recorder's mode in the following order: Clock mode, Timer Set mode, Clock Set mode, then return to the Clock mode.

● **Simulcast button (SIMUL)**
When recording FM simulcast TV programmes, press this button (anytime, except when in the AUX m[illegible] to set to the simulcast mode. "SIM" will light on [illegible] and the video from the built-in tuner and the hi fi [illegible] from the rear panel AUDIO EING. connectors will be recorded. (See page 52.)

㉚ **Set/Tracking/V.lock/Fine tuning buttons (-/+)**
(EINSTELLEN/SPURLAGE/V-BILDFANG/FEIN)
These are triple-function buttons:
- as an EINSTELLEN button – press to set the correct data in the Clock Set or Timer Set mode.
- as a SPURLAGE/V-BILDFANG button – press to minimise noise bars, if observed, during playback (for automatic digital AV tracking information, refer to page 49) or press to eliminate vertical vibration of the picture, if observed, in the Still mode.
- as a FEIN button – press to shift the frequency in either direction to fine-tune in a specific station in the Real Channel mode.

㉛ **SP/Hi-Fi LP button**
Normally set this button to the SP (Standard Play) mode ("SP" lights on the FDP) when recording. In the SP mode, both pictures and sound are recorded, allowing up to 4 hours of continuous recording with a single cassette (E-240). When using this recorder as an audio deck, you can use the LP (Long Play) mode by pressing this button to obtain the LP indication on the FDP. In this mode, Hi-Fi audio recording is possible for up to 8 hours with a single cassette (E-240).

● **Select/Summer time adjust button**
(AUSWAHL/SOMMERZEIT EINST.)
This is a dual-function button:
- as an AUSWAHL button – press to select the item to be set in the Clock Set, Real Channel or Timer Set mode.
- as a SOMMERZEIT EINST. button – press and quickly release to advance the clock by one hour, hold it pressed for 2 seconds to set the clock back by one hour (see page 45).

● **Timer button (SCHALTUHR)**
Press to engage the Timer Standby mode.

● **START button**
Press to engage the 24-Hour Instant Timer Set mode. (See page 53.)

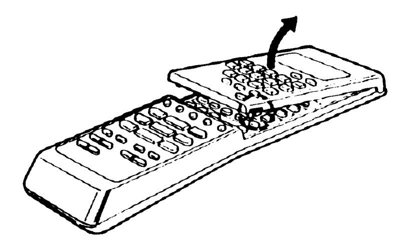
● **Audio dubbing button (VERTONUNG)**
Press while in the Still mode, then the ►/X2 button for audio dubbing.

● **TV programme ∨ / ∧ buttons (TV PR.)**
Press either button to scan to a desired [illegible].

● **Infrared beam receiving window**

Remote Control Unit

Grasp the cover where the side tab is located and swing open the cover.

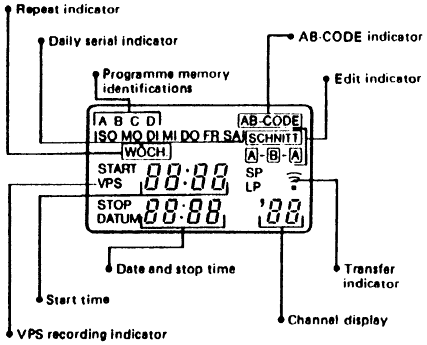


● **A/B code button (A/B-CODE)**
When using two JVC video decks, press to switch this remote control from the "A" mode to "B" mode, or vice versa, depending on the deck to be controlled. (See page 39 and 60.)

● **Transfer/Summer time adjust button (ÜBERTRAG/ SOMMERZEIT EINST.)**
- as an ÜBERTRAG button – press to transfer the data held in the remote control's clock and timer memory to the recorder.
- as a SOMMERZEIT EINST. button – press to adjust the remote control's clock to the summer time setting. (See page 46.)

● **Timer button (SCHALTUHR)**
Functions same as ● .

● **LCD (Liquid Crystal Display) panel**
Refer to this panel when programming the remote control's built-in timer memory.



● **Memory programme button (SPEICHER AUFZ. NR.)**
Press to programme the remote control's timer memory.

● **Clock adjust button (UHREINSTELLUNG)**
Press to adjust the clock of the remote control.

● **Memory cancel button (SPEICHER LÖSCHEN)**
Press to cancel the programmed data in the remote control's timer memory.

● **Video programme button (VIDEO AUFZ. NR.)**
Press to engage the recorder's Timer Set mode.

● **Video cancel button (VIDEO LÖSCHEN)**
Press to cancel the programmed data held in the recorder's timer memory.

● **Multi-purpose numeric keys**

Clock setting:	See page 46.
Channel selection:	See page 47.
Timer Programming:	See page 57.
Realtime Go-To and Search functions:	See page 55.
Index Search:	See page 54.
External Source recording:	See page 59.

● **Display button (ANZEIGE)**
Press to switch the display between the realtime tape counter and date.
Also press to change the display from the Timer Set mode to the Clock mode.

● **Counter reset button (RÜCKST.)**
Press to reset the Realtime Counter display to "0St 00M 00S".

● **VPS/Channel button (VPS/KANAL)**

● **Cursor (⇤ / ⇥) buttons (CURSOR)**
When setting the timer, use these buttons to move the cursor to the position for data entry.

● **INDEX button**
Press to engage the Index Search mode. (See page 54.)

● **Erase button (LÖSCHEN)**
Press during playback to erase an index code. (See page 54.)

● **Mark button (MARKE)**
Press during playback or recording to put an index code onto the tape. (See page 54.)

● **Go-To button (ZIELLAUF)**
Press to engage the Realtime Go-To mode. (See page 55.)

● **Intro button (TITEL[illegible])**
Press to engage the [illegible] search mode. (See page 54.)

● **Edit mode button (SCHNITT-BETRIEB)**
Press to engage the Duet Editing mode between two decks. (See page 60.)

● **Stand-by button (SCHNITT-BEREIT)**
Press in the Duet Editing mode to engage the player deck in the Still mode and the recorder deck in the Record-Pause mode. (See page 60.)

● **AUDIO MONITOR button**
Functions same as ● .

● **Start button (SCHNITT-START)**
Press in the Duet Editing mode to start editing between the two decks. (See page 60.)

● **Teletext buttons**
For teletext operation. (See page 64.)

● **Variable search buttons (<</>>)**
Press either button to search for a specific segment of the programme at variable speeds. (For details, see page 50.)

● **❚❚ (Pause/Still) button**

● **► /X2 (Play/X2) button**

● **◄◄ / ►► (Rewind) (Fast-Forward) (Shuttle Search) buttons**

● **● (Record) button**
Press together with the ► (play)/X2 button ● to start recording.

● **■ (Stop) button**

● **SP/Hi-Fi LP button**
Functions same as ● .

● **Cassette eject button (CASSETTE)**
Press to eject the cassette.

● Video operate button (BETRIEB VIDEO)
Press to turn the recorder power ON or OFF.
Keep this button pressed for 2 seconds when turning the power off to engage the Child Lock mode. (See page 44.)

● **TV programme buttons (TV PR.)**
Function same as ● .

TV Operation buttons (designated TV models only)

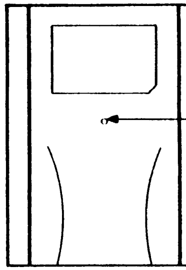
● **MONITOR (TV/VIDEO) button**
Press to select the TV's operating mode.
TV: For viewing broadcast programmes or tape programmes via HF-AUSGANG connection.
VIDEO: For viewing programmes via the AV connection.

● **TV operate button (BETRIEB (TV))**
Press to turn the TV power on or off.

● **TV channel buttons (KANAL)**
Press to select a desired channel on the TV receiver.

● **TV volume buttons (LAUTSTÄRKE)**
Press to decrease or increase the TV's sound volume.

Remote Control Unit's RESET button



RESET button
Insert a pointed object into the hole to press the initialize button inside, when required. The memory for the LCD display will be cleared.
Normally do not touch this button.

Rear of the remote control unit

Note:
When the optional VPT (VPV) adapter is connected, all buttons located on the cover of the upper portion of the remote control unit function for teletext operation when the cover is closed. Also four coloured keys and several buttons located on the lower portion of the remote control have additional teletext functions, as indicated by their additional labels.

Rear Panel

(76) AC outlet (GESCHALTET)
Connect the power cord of other audio or video equipment (such as an FM tuner) requiring less than 2 amperes of power.

Warning:
The switched AC outlet should not be used for connection of TVs and other apparatus in which unintended switching could result in fire or other hazard.

This outlet is controlled by the NETZAUSGANG switch ⑬. When the NETZAUSGANG switch is set to AUS, this outlet supplies (220 V∿, 50/60. Hz) regardless of the BETRIEB button setting as long as the power cord of the recorder is plugged in.
When the NETZAUSGANG switch is set to EIN, this outlet supplies power only when the recorder is on.

(77) AUDIO/VIDEO socket
A 21-pin standardised audio/video input/output socket for AV connection to a TV or a 2nd video recorder. The input from this socket can be recorded in the AUX (AV) mode engaged by obtaining "AU" in the channel display.

(78) VPV/VPT connector
Connect the optional VPT (VPV) adapter for decoding teletext programmes and for teletext timer programming.

(79) Remote pause terminal (PAUSE FERNBEDIENUNG)
When using a JVC video camera, connect the remote control cable of the camera adapter to this terminal for the purpose of controlling the starting and stopping of the tape with the camera's start/stop switch. When used with a JVC VideoMovie equipped with the Master Edit Control system, this terminal makes quality editing simple.

(80) Aerial input connector (ANTENNEN-EINGANG)
Connect an aerial to this connector.

(81) Attenuator switch (ANT. SIGN.)
Set to SCHWACH to receive broadcasts from distant stations. Set to STARK to receive broadcasts of high field strength.

(82) TEST signal switch
Set to EIN when tuning your TV receiver for the video channel. A test signal in the form of two vertical white bars will be available.

(83) Audio input connectors (AUDIO EING.)
Connect an audio tape recorder or other audio sources for recording sound.

(84) Audio output connectors (AUDIO AUSG.)
Both hi-fi and normal audio signals can be obtained from these connectors. The output can be selected with the AUDIO MONITOR button ㉑ and Hi-Fi/NORM/MIX button ㉒.

(85) RF output connector (HF-AUSGANG)
Connect to the aerial terminal of a TV receiver through the aerial cable (provided).

(86) RF converter frequency adjustment screw (K40 – K32)
(See page 41.)

(87) Power cord

Remote Control Unit

A/B mode switching
When you own two JVC video decks, this remote control can operate both decks separately; they do not respond simultaneously to the remote control's signal, if they are set to respond to different codes. Initially this recorder is set in the "A" mode.
To change the mode, carefully follow the instructions below:

(1) Unplug the power cord of the recorder from the AC outlet.
(2) Press the A/B-CODE select button to engage the "B" mode; "B-CODE" will appear on the LCD.
(3) Plug the power cord of the recorder into the AC outlet.
(4) Turn on the power of the recorder using the remote control's BETRIEB (VIDEO) button.

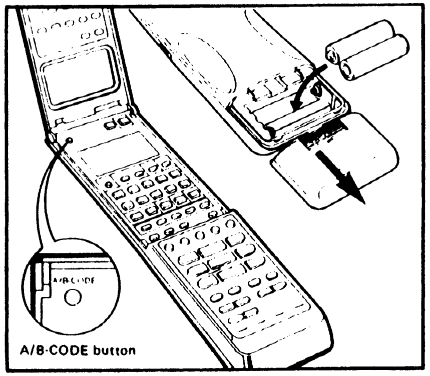
The recorder "memorizes" this B code and will respond only to the B code signals. Set the other deck to respond to the A code signals in the same procedure.

Note:
Do not operate other remote controls after you have plugged the recorder into the AC outlet and before you press the BETRIEB (VIDEO) button of this remote control.

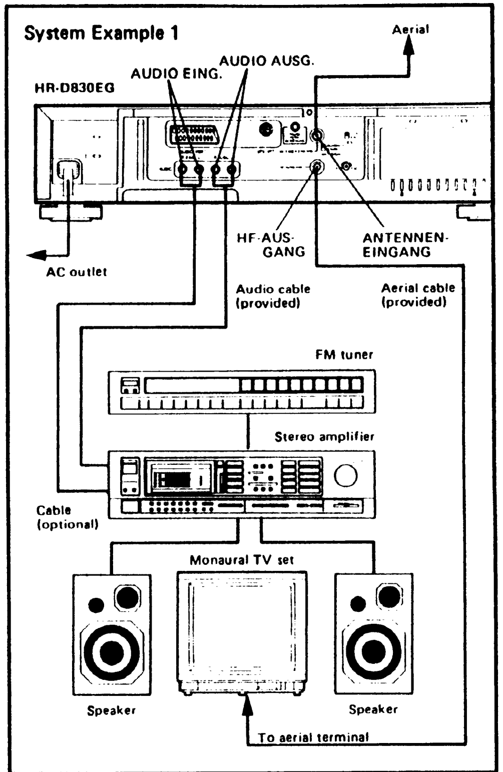
CAUTION:
Some televisions may malfunction in response to this remote control when used in the "B" mode. If this should happen, switch the mode back to "A".

Operating distance for remote control unit
- The maximum operating distance is about 8 m.

Installing the batteries
- Insert two "R6"-size batteries (provided) into the battery compartment on the rear of the remote control unit, observing correct polarity.



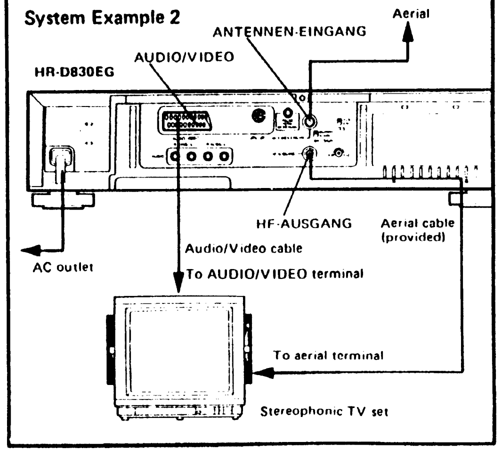
System Example 1



Procedure
1. Remove the aerial cable from the TV receiver and reconnect to the recorder.
2. Connect the recorder to the TV receiver using the aerial cable (provided).
3. Connect the AUDIO EING. L and R (83) connectors of the recorder to the recording output terminals of the amplifier. (Exactly as one hooks up an audio cassette deck.)
4. Connect the AUDIO AUSG. L and R (84) connectors of the recorder to the AUX IN or TAPE MONITOR terminals of the amplifier.

Notes:
- Observe L and R when connecting the audio input and output connectors of the recorder to a stereo amplifier.
- If stereo or bilingual TV broadcasts are receivable in your area, this recorder can record them independently of the TV set and play them back through the connected audio system.
- When listening to sound from the connected stereo system, turn down completely the sound volume of the TV receiver.
- Listening to stereophonic sound is also possible using stereo headphones connected to the front panel KOPFHÖRER jack ⑫.
- With this setup, you can enjoy prerecorded Hi-Fi VHS video tapes in hi-fi stereo while viewing them on a regular TV receiver, and also you can record FM simulcast television programmes with hi-fi audio accompaniment. See page 52.
- If you want to timer-control the recording of FM simulcast programmes, connect the tuner's power cord to the recorder's AC outlet. Set the NETZAUSGANG switch ⑬ to EIN, and both the tuner and the recorder will be switched on at a time preprogrammed by the recorder. Timer-controlled recording of FM simulcast programmes is not possible with the type of tuners which reset the channel each time the power is switched off.

System Example 2



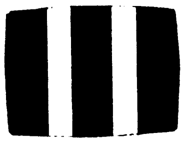
For customers who own a stereo TV equipped with a standardised audio/video socket

By connecting the 21-pin AUDIO/VIDEO socket (77) of the recorder to your TV's audio/video socket, it is possible to play stereo tapes through the TV's speakers. In this case, use the A/V mode specified on your TV, instead of UHF channel 36.

CAUTION
- This recorder has a dynamic range of more than 90 dB with regards to its hi fi audio capability. It is recommended that you check the maximum level if you are going to listen to the hi-fi audio signals through a stereo amplifier. A sudden surge in speaker input may cause speaker damage.
- Some speakers and televisions are specially shielded to prevent television interference. If both are of the non-shielded type, do not place the speakers adjacent to the TV set, otherwise the video playback picture will not be normal because of mutual interference.

VIDEO CHANNEL SETTING

1. Press the BETRIEB button ⑪ to turn the power on. Turn on the TV receiver.
2. Set the TEST switch ㊷ to EIN
3. Adjust your TV receiver in the vicinity of UHF channel 36 until you bring in the two white signal bars on the screen as illustrated. This is your VIDEO CHANNEL.
4. Reset the TEST switch to AUS.



Notes:

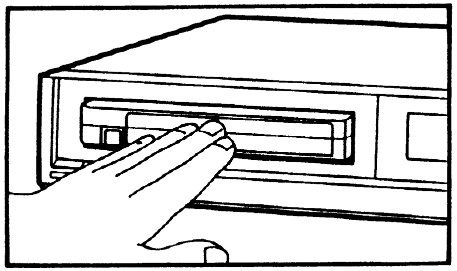
- If some interference noise is seen on the screen because of broadcasts on neighbouring channels or if your preset broadcasts should be affected in picture quality, it is necessary to shift the RF converter output frequency from that of channel 36. Consult your JVC dealer for making this adjustment.
- Video channel setting is also possible using a prerecorded VHS video cassette. Play back the tape and tune the TV receiver to obtain clear pictures and sound while monitoring the playback picture on the TV screen.
- If your TV receiver is not provided with an AFC circuit, perform fine tuning of the TV receiver when you are actually viewing video cassettes.

LOADING AND UNLOADING A CASSETTE

Loading

Insert a cassette as illustrated. Be sure to insert it firmly into the slot; otherwise, it will be automatically ejected.

- The automatic loading mechanism will operate only when the cassette in inserted correctly.
- With a cassette inserted, the "cassette loaded" indicator will appear on the FDP.



Unloading

Press the ■ / ≜ button ❼ in the Stop mode.

AUTO POWER-ON AND AUTO PLAY SYSTEM

- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

POWER-OFF EJECT SYSTEM

- The cassette can be unloaded even after the power has been turned off. Pressing the ■ / ≜ button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

CAUTION

- If unloading of the cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the SCHALTUHR button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.
- Do not insert fingers or any foreign object beyond the door of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

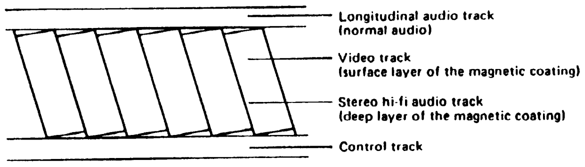
INFORMATION ON THE HR-D830EG'S AUDIO SYSTEM

Hi-Fi and normal audio

To provide true hi-fi audio accompaniment to video entertainment and, at the same time, compatibility with regular VHS tapes, this recorder employs a unique audio recording system. Hi-fi audio signals (2-channel) are recorded deep into the tape's magnetic coating, and the video signal is recorded on top of the audio signals in a shallower layer. At the same time, another audio head records normal audio signals (monaural) onto the usual longitudinal audio track. Since this longitudinal audio track is exactly the same as on regular VHS tapes, tapes recorded on the recorder can be played back on other VHS machines, and vice versa. Also, this longitudinal track can be replaced later with new recordings through audio dubbing.

CAUTION:
The hi-fi soundtrack recorded with the recorder cannot be reproduced with video equipment other than Hi-Fi VHS.

Tape pattern recorded with this recorder



Hi-fi audio recording and reproduction are availabe only from the hi-fi audio track while the longitudinal audio track provides normal audio.

The hi-fi and normal soundtracks are recorded simultaneously, and audio dubbing is applicable only to the normal audio.

Recording options according to the selected input mode

Track / Input mode	Video track	Normal audio track (mono)	Hi-fi audio track (2-channel)
TUNER ⊡ SIMUL (button pressed to OFF)	TV picture (from built-in tuner)	TV sound (from built-in tuner)	TV sound (from built-in tuner)
SIMUL ⊡ SIMUL (button pressed to ON)	TV picture (from built-in tuner)	TV sound (from built-in tuner)	Audio signal from AUDIO EING. (Mixing with microphone input is possible.)
AUX AU Channel display section	Video signal from AUDIO/VIDEO	Audio signal from AUDIO/VIDEO (Mixing with microphone input is possible.)	

Notes:

- To engage the AUX mode, press the "0" key of the 10-digit keypad.
- Microphone input will be mixed with the audio signals on the hi-fi audio track. Therefore, be sure to turn the MIKROFON-MIX control ⓯ to MIN or disconnect the microphone when microphone input is not required.
- You can record audio only (without recording any video signal) in either the SP or LP mode. In the LP mode you can enjoy up to 8 hours of hi-fi stereo recordings with a single cassette (E-240).

Recording options according to the type of broadcasts and the setting of the 2-KANALTON switch

Type of broadcast	2-KANALTON switch position / Audio Track	Normal audio track (mono)	Hi-fi audio track (2-channel) L	Hi-fi audio track (2-channel) R
Regular (monaural audio)	Either position	Mono	Mono	Mono
Stereo broadcast	Either position	L + R mixed	Stereo	
Bilingual broadcast	HAUPT	Main soundtrack (local language)	Main soundtrack (local language)	Sub soundtrack (foreign language)
	NEBEN	Sub soundtrack (foreign language)		

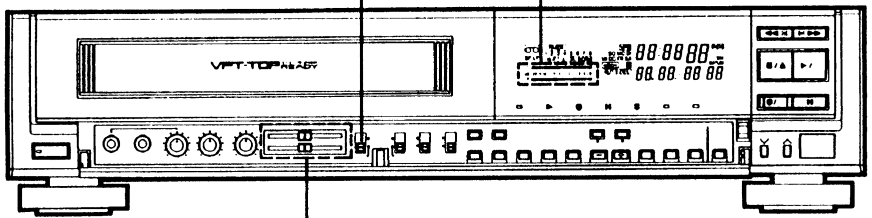
Hi-Fi audio recording level adjustment

While recording onto the normal audio track is controlled by the built-in Automatic Level Control circuit, hi-fi audio recording has two control options: manual and automatic.

AUDIO-BEGRENZER switch
Setting this switch to EIN activates the built-in audio limiter circuit for both channels so that the recording level is automatically controlled. For manual adjustment, set this switch to AUS. (The recording level for normal audio is always controlled automatically regardless of the setting of this switch.)

Audio level indicators
For manual control of the recording level, first set the relevant switches as follows:
AUDIO-BEGRENZER ● → AUS
AUDIO MONITOR ㉑ → Hi-Fi L and R (Hi-Fi Stereo)
Then slide the Hi-Fi AUFNAHME AUSSTEUERUNG controls referring to these indicators. When indicators up to or near 0 dB light for the loudest signal being applied, the recording level is optimum. (The level at which only one red indicator lights from time to time may be most appropriate.)
During playback, these indicators show the level of audio signals recorded on the tape.

Notes:
- With the AUDIO MONITOR and Hi-Fi/NORM/MIX buttons pressed so either Hi-Fi, L, R or NORM lights on the FDP, the recording level of hi-fi audio signals cannot be correctly indicated. Select the Hi-Fi, L and R indication when adjusting the recording level.
- The normal audio signal level is also displayed by these indicators, but cannot be adjusted.



Hi-Fi AUFNAHME AUSSTEUERUNG controls
Slide these controls, the upper for left channel and the lower for right channel, for manual adjustment of the hi-fi audio recording level.

Dual-audio playback flexibility

Two different types of audio tracks (hi-fi and normal) allow a variety of playback options depending on the connection and the settings of relevant controls and switches.

Relevant audio signal output connectors:

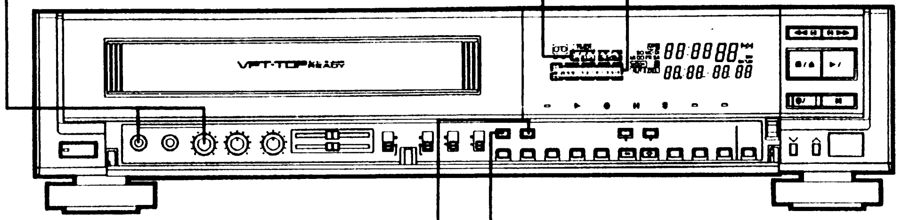
1. **HF-AUSGANG connector**
Delivers audio (both hi-fi and normal) and video signals to a TV receiver. When the recorder is not used, the aerial signal is supplied from this connector to the TV receiver to allow regular TV viewing; when a video tape is played back through the HF-AUSGANG connector, the audio is reproduced always as monaural; with hi-fi stereo tapes, both channels are mixed or the one selected by the AUDIO MONITOR button is reproduced. Therefore, for stereo playback, connect a stereo system to the AUDIO AUSG. connectors or a stereo television to the AUDIO/VIDEO socket. Refer to page 40.
2. **AUDIO AUSG. connectors**
Delivers the audio signals from both hi-fi and normal audio tracks.
3. **AUDIO/VIDEO socket**
Delivers audio (both hi-fi and normal) and video signals. (Also accepts audio and video signals for recording from other video equipment.)

Corresponding buttons to select audio channels for listening

KOPFHÖRER jack and KOPFHÖRER-PEGEL control
Delivers the audio signals from both hi-fi and normal audio tracks. The headphone output level is adjustable with the KOPFHÖRER-PEGEL control.

Audio monitor indicators (HI-FI, L, R, NORM)

Audio level indicators



AUDIO MONITOR button
Selects the hi-fi audio channel (left, right or both) for listening. Use this button together with the Hi-Fi/NORM/MIX button referring to the four indicators (Hi-Fi, L, R and NORM) on the FDP.
- When the power is turned on, the Hi-Fi, L and R indicators light and both hi-fi stereo soundtracks can be listened to. Press this button and the Hi-Fi and L indicators light to listen to only the left hi-fi channel sound.
- Press this button again and the Hi-Fi and R indicators light to listen to only the right hi-fi channel sound.

Notes:
- With the Hi-Fi/NORM/MIX button pressed for the NORM setting, pressing the AUDIO MONITOR button has no effect.
- This button functions during recording as well, although it has no effect on the recorded signal.

Hi-Fi/NORM/MIX button
Operates in conjunction with the AUDIO MONITOR button to select sound tracks for listening.
- When the power is turned on, both hi-fi stereo soundtracks can be listened to. Press this button once to listen to only the normal soundtrack (the NORM indicator lights). Press this button again to listen to a mixture of hi-fi stereo (Hi-Fi, L and/or R), and normal soundtracks, by selecting the combination with the AUDIO MONITOR button.

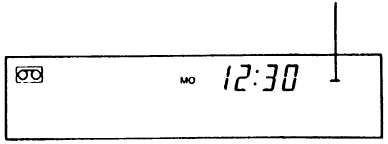
Notes:
- This button functions during recording as well, although it has no effect on the recorded signal.
- When playing back a tape containing the same soundtrack on both hi-fi and normal audio tracks, a slight time lag is sensed between the two soundtracks, probably with some distortion when listening in the Mix mode.

CHILD LOCK FUNCTION

The Child Lock function is for preventing accidental operation by young children, or other unwanted operation, such as playing back or recording over an important cassette you may have intentionally left inserted in the recorder. By engaging the Child Lock mode, the operation buttons on the recorder become ineffective, unless the remote control is used.

To engage the Child Lock mode

- Press the remote control's BETRIEB (VIDEO) button (70) to turn the recorder power off and keep this button pressed for about 2 seconds after the power LED indicator has gone off.
- The Child Lock indicator (-) will appear in the channel display section on the FDP to show that the recorder is now in the Child Lock mode.



To disengage the Child Lock mode

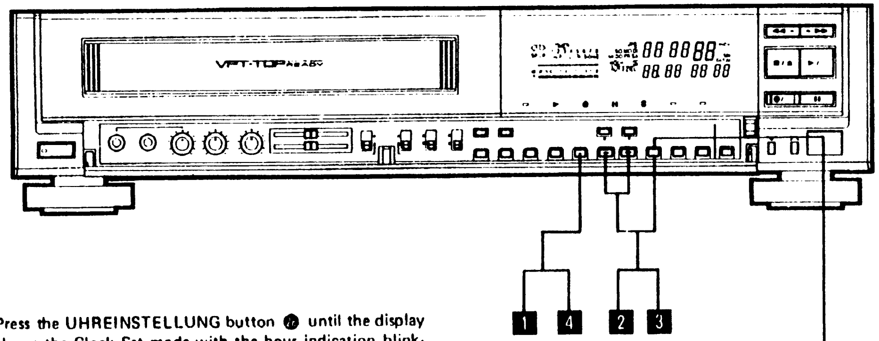
- When the remote control's BETRIEB (VIDEO) button is pressed to turn the recorder power on, this disengages the Child Lock mode. The recorder will turn on and the corresponding display will appear with the channel number appearing where the child lock indicator appeared before.
- Pressing the SCHALTUHR button during timer recording also disengages the Child Lock mode.

Notes:
- While in the Child Lock mode, the recorder can receive timer programmed data from the remote control.
- Timer recording is possible also, even while in the Child Lock mode. After timer recording has been performed, the Child Lock mode remains in effect.
- Even after automatic cassette ejection at tape end, following timer recording, the Child Lock mode remains in effect.
- It is possible to insert a cassette while in the Child Lock mode. After inserting a cassette, the Child Lock mode remains in effect.

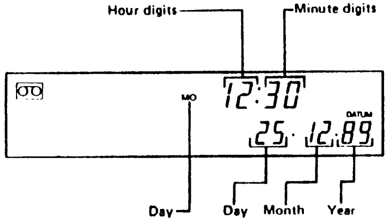
CLOCK SETTING

Setting the built-in clock

Plug the recorder into an AC outlet. The display shows a blinking 0:00.



1. Press the UHREINSTELLUNG button ● until the display shows the Clock Set mode with the hour indication blinking.
2. Set the hour and minute in that order by using the AUSWAHL and EINSTELLEN buttons ● ● alternately.
   - The blinking position is ready for entry.
   - Press EINSTELLEN until the correct indication appears in each position.
3. Set the day, month and year in the same way.
   - In year setting, set only the last two digits of the year.
4. Press UHREINSTELLUNG.
   - Press it at the exact instant of the time signal, and the clock will be set accurately to the present time.
   - The day-of-the-week indication will be displayed automatically.



Notes:

- Clock setting is not possible in the timer recording standby mode. First check to see that the TIMER indicator on the FDP is not lit.
- Enter the day within 10 seconds after pressing the UHREINSTELLUNG button.

SUMMER TIME ADJUST

This convenient feature is for quickly making the annual clock adjustment to the "summer time" (daylight saving time) setting, and back to regular time later.

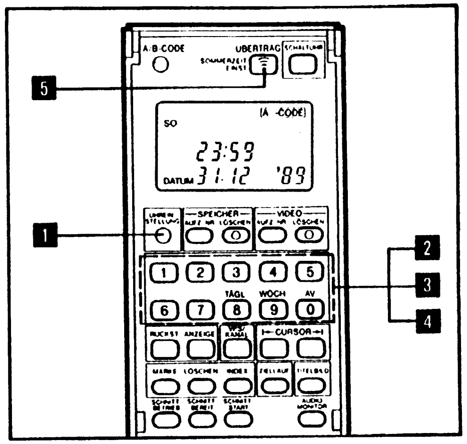
1. Simply press and quickly release the SOMMERZEIT EINST. button ● to set the clock forward by one hour.
2. Later in the year, to switch back to regular time, simply hold the SOMMERZEIT EINST. button pressed for 2 seconds to set the clock back by an hour.

Power failure indicator

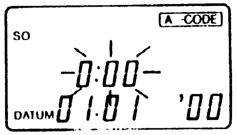
The blinking 0:00 (initial condition of the display) is also a power failure indicator, showing that there has been a power failure exceeding about 3 to 5 minutes. Readjusting the time restores the normal condition of the clock display.

Setting the LCD clock of the remote control unit

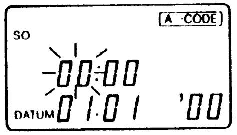
The LCD clock is independent of the recorder's clock.
The recorder's clock can be adjusted from the remote control unit if its transfer function is used.



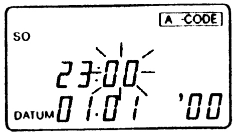
Insert 2 "R6"-size batteries (provided) into the remote control. The LCD shows the following with "0:00" blinking.



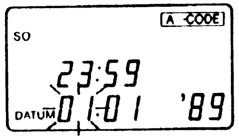
1. Press the UHREINST [illegible] button.
   - The hour indication will blink.



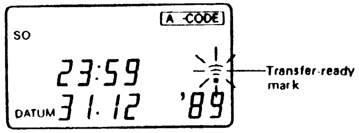
2. Press the numeric keys corresponding to the current hour, then the minute indication will blink.
   - Always key in two digits.
     For a one-digit number, key in "0" first.



3. Key in the digits corresponding to the current minute, then the day position of the DATE indication will blink.



4. Key in the digits for the day, month and year in succession.
   - In year setting, set only the last two digits of the year.
   - After setting the year, the transfer-ready mark will appear and blink.



5. Press the ÜBERTRAG button at the exact instant of the time signal.
   - The day-of-the-week indication will be displayed automatically.
   - The clock of the remote control will be set accurately to the second and, at the same time the set data will be transferred to the clock of the recorder.
   - When it is not necessary to transfer the clock data to the recorder, press UHREINSTELLUNG instead of ÜBERTRAG to set the remote control's clock.
   - If the transfer-ready mark disappears before transmission, press the UHREINSTELLUNG button to make it reappear, then press ÜBERTRAG button while the transfer-ready mark is blinking; otherwise, the ÜBERTRAG button will function as a summer time adjust button.
   - If the clock has already been set, the transfer-ready mark starts blinking when the UHREINSTELLUNG button is pressed.
   - To transfer the data to the recorder's clock, simply press the ÜBERTRAG button.
   - To readjust the clock, press the UHREINSTELLUNG button and then press either CURSOR ⇤ / ⇥ button so that the position which requires correction blinks.

SUMMER TIME ADJUST

For quickly making the annual clock adjustment to the "summer time" (daylight saving time) setting, and back to regular time later, use the SOMMERZEIT EINST. button ●.

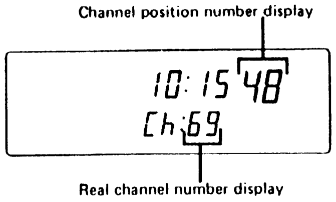
1. Simply press and quickly release the SOMMERZEIT EINST. button in the Clock mode to set the clock forward by one hour.
2. Later in the year, to switch back to regular time, simply hold the SOMMERZEIT EINST. button pressed for more than 2 seconds to set the clock back by an hour.

Note:

- For summer time adjustment, make sure that the transfer-ready mark is not on the LCD.

OPERATING THE BUILT-IN TUNER

This recorder incorporates an advanced frequency synthesized tuner which is pretuned to 91 channels to cover VHF, UHF and CATV broadcasts. Channel indication is given in two different ways: real channel numbers and channel position numbers. Real channel number indication is available by pressing the KANAL-EINSTELLUNG button ㉓ or VPS/KANAL button ●, or during search by pressing the SUCHLAUF button ●, while channel position number indication is always available in the channel display.



Correspondence between 91 pretuned TV stations and the recorder's real channel indications

Display	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
VHF	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11 (H1)	E12 (H2)	A	B	C	D	E	F	G	H
Display	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
UHF	E21	E22	E23	E24	E25	E26	E27	E28	E29	E30	E31	E32	E33	E34	E35	E36	E37	E38	E39
Display	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
UHF	E40	E41	E42	E43	E44	E45	E46	E47	E48	E49	E50	E51	E52	E53	E54	E55	E56	E57	E58
Display	59	60	61	62	63	64	65	66	67	68	69								
UHF	E59	E60	E61	E62	E63	E64	E65	E66	E67	E68	E69								
Display	75	76	77	78	79		81	82	83	84	85	86	87	88	89	90	91	92	93
CATV	X	Y	Z	–	–		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
Display	94	95	96	97	98	99	00												
CATV	S14	S15	S16	S17	S18	S19	S20												

Stored channels

A total of 91 channels are receivable. Of them, up to 48 can be stored for easy channel selection. Prior to shipment, some channels are stored.

It is possible to store more channels or skip some channels if there are no broadcasts on those channels in your area. It is possible to change the stored channels to correspond to your preferred channel allocation. Skipped channels can be restored whenever necessary.

- Channel memories are permanent; the programmed channel allocation will not be erased even if the recorder is unplugged from the AC outlet.

Channel selection

To select a channel for recording, normally use the TV programme (∨/∧) buttons ● (● on the remote control) or 10 numeric keys ●. You can choose any channel from among the stored ones by calling up the corresponding channel position number.

- Use the "∨" button to scan to a channel in the direction of decreasing numbers; the "∧" button, in the direction of increasing numbers.
- An invalid number larger than 48 will be rejected.

If you want to select a channel other than those stored, engage the Real Channel mode and call up a channel, while referring to the real channel number display.

With recorder's controls:

- Simply press the SUCHLAUF button ●.

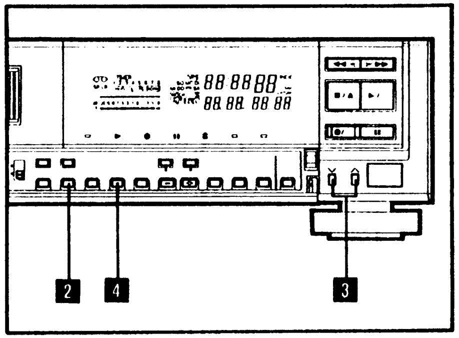
With remote control:

- Press the VPS/KANAL button ● to engage the Real Channel mode and call up a channel by using the 10 numeric keys. For details, refer to the next page.

Storing channels

TV receiver

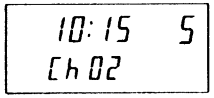
Turn the TV receiver to ON and adjust it to your video channel.



A. Automatic setting

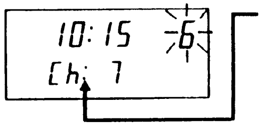
■ Turn the power on.
- The display will change from the Date mode to the Counter mode.

■ Press the SUCHLAUF button ●.
- The display will change to the Real Channel mode and automatic scanning will take place.
- Reverse search will be engaged if the SUCHLAUF button is kept depressed.



VHF channel 2 is stored for channel position 5.

- When a broadcast is detected, scanning stops automatically and the displayed channel position number will blink.



"Colon" will appear to indicate that this real channel is not stored for the indicated channel position.

■ Select a channel position into which you wish to store that station by using the TV programme (∨/∧) buttons while the channel position number is blinking.

■ After confirming the real channel number and channel position number, press the SPEICHERN button ●.
- The channel position number stops blinking.
- "Colon" will disappear and the selected station has been stored.

B. Manual Setting from remote control unit

(1) Press the VPS/KANAL button ●.
- The display will change to the Real Channel mode.

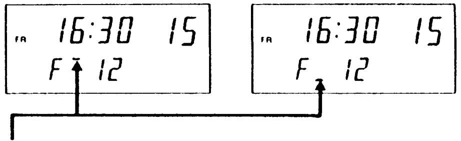
(2) Press VPS/KANAL until the real channel number starts blinking.
- Blinking will stop in 10 seconds.

(3) Enter the number of a real channel to be preset.
- The channel position number will start blinking.

(4) Select a channel position into which the selected real channel is to be stored, using the 10-digit keypad.
- Depress the numeric key for the second digit continuously until blinking stops. This enables the entered number to be stored.
- The display will return to the clock mode by simply keying in the channel number to be viewed.

- **Fine Tuning**

For fine tuning, press the AUSWAHL button ● in step 3 (both in automatic and manual setting) and use the FEIN "+" or "-" button ●; "+" to fine-tune in the direction of increasing frequencies, and "-" to fine-tune in the direction of decreasing frequencies.



Upper or lower "-" sign indicates the operating tuning frequency is above or below the standard broadcast frequency.
Centre "-" sign will appear when it corresponds to the standard.

Skipping the stored channels

1. Call up the channel position number that you wish to skip by using the TV programme (∨/∧) buttons or 10 numeric keys.
2. Press the KANAL-EINSTELLUNG button ㉓.
3. Press the SPRINGEN button ●.
   - "Colon" will appear to indicate that the displayed real channel is not stored.
   - The skipped channel number will not appear on the channel display during up/down scan tuning.

Note:

If no command is given after each step of the setting operation, the Real Channel mode will be automatically cancelled in 10 seconds.

PLAYING BACK A VIDEO CASSETTE

1 Turn the TV receiver on and adjust it to your video channel.

2 Load a pre-recorded cassette.
- Power will be switched on automatically.
- When the cassette loaded has no safety tab, playback will start automatically.

3 Press the ▶ /X2 button ❾.

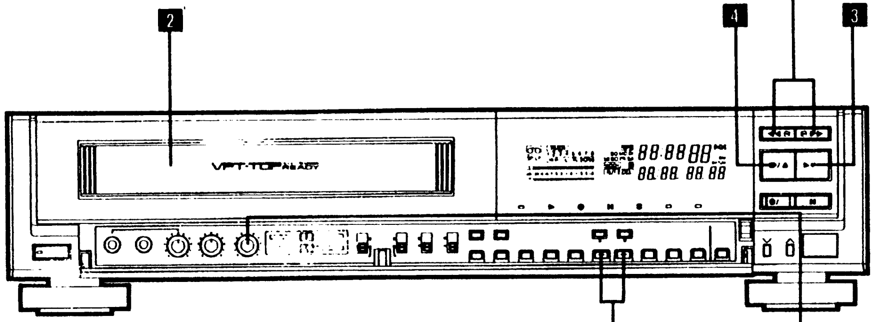
4 Press the ■ / ⏏ button ❼ at the end of the programme.
- The tape will be rewound automatically when its end is reached and the recorder will enter the Stop mode.

Note:
Only SP (Standard Play) recordings can be played back.

SHUTTLE SEARCH

Shuttle Search allows high-speed playback at 9 times normal speed in either direction.

1. Press either ◀◀ or ▶▶ Shuttle Search button ❽ during playback.
2. To cancel the Search mode, press the ▶ /X2 button.
   - For briefer scanning, keep the Shuttle Search button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled.



DIGITAL AV TRACKING SYSTEM

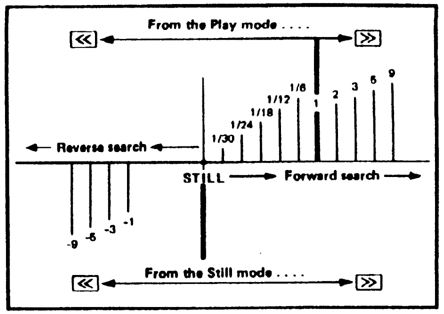
This recorder incorporates a digital AV tracking system for automatic tracking adjustment. In most cases you do not have to adjust tracking.
- When you start playback after inserting a tape, the digital tracking system automatically adjusts the tape path relative to the heads to obtain the best possible pictures and Hi-Fi stereo sound.
- If there is no recorded Hi-Fi audio, tracking is set referring only to the video signal. The audio output is automatically switched to normal audio.
- This automatic adjustment also takes place when the playback output level reduces below a certain level.
- The DIGITAL-AV-SPURLAGE indicator ❷ blinks while the system is searching for optimum tracking, and remains lit as long as the automatic tracking mode continues.

If automatic tracking fails, and some noise bars are visible on the screen, use the manual tracking mode.
- Press the SPURLAGE "+/-" buttons ● simultaneously to cancel the automatic mode, then press either button to move noise bars off the screen.
- To return to the automatic mode, press both buttons simultaneously.

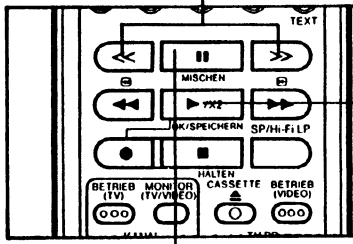
Picture Sharpness Adjustment
Images on the screen can be adjusted to a preferred softer or sharper definition by turning the BILDSCHÄRFE control ● in the corresponding direction.

SPECIAL-EFFECTS PLAYBACK

Variable search (≪ and ≫)
Variable speed search is possible in either forward or reverse direction from either the Still or Play mode.
- To search in the forward direction:
  - Press the ≫ button in the Play mode to start fast-motion searching from 2 times normal speed. To increase speed (to 3, 5, 9 times normal), press ≫ repeatedly.
  - Press the ≫ button in the Still mode to start slow-motion searching from 1/30 normal speed. To increase speed (to 1/24, 1/18, 1/12, 1/6, normal, X2, X3, X5, X9), press ≫ repeatedly. To decrease speed, press ≪ repeatedly. (Pressing the ≪ button in the Play mode, starts slow-motion searching at 1/6 normal speed.)
- To search in the reverse direction:
  - Press the ≪ button in the Still mode to start searching in the reverse direction at the same speed as normal speed playback. To increase speed (to -3, -5, -9 times normal), press [illegible] repeatedly. To decrease speed, press ≫ repeatedly.
- To return to the normal Play mode, press the ▶ /X2 button.

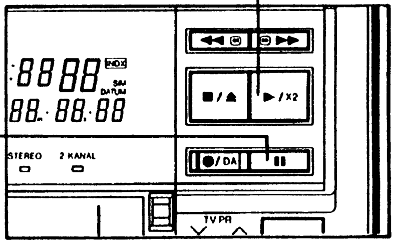


Note:
- Vertical vibration of the picture may be observed during double-speed or slow-motion playback. Press the ❚❚ button to obtain a still picture and then correct it by using the V-BILDFANG buttons.



DOUBLE-SPEED PLAYBACK

- Press ▶ /X2 while in the Play mode; double-speed playback will be engaged.
- To resume normal playback, press the same button again.



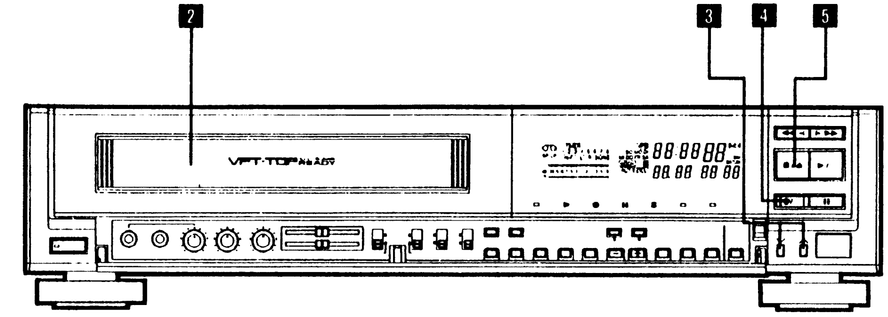
STILL PICTURE

1. Press ❚❚ during playback.
2. To advance the still picture, press ❚❚ a number of times.
3. To cancel the Still mode, press ▶ /X2.

Notes:
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- With some televisions, the still picture may be unstable. This is not due to any defect of the unit. If vertical vibration of the picture is observed, attempt to correct it by using the V-BILDFANG buttons ●.

Notes:
- No audio is available during any Special-effects Playback mode.
- If noise bars are visible while in a Special-Effects Playback mode, first press the ▶ /x2 button to engage the normal Play mode; then press the SPURLAGE -/+ buttons simultaneously to cancel the Automatic Tracking mode. Next, press the corresponding button to return to the previous Special-Effects Playback mode, and then perform the manual tracking adjustment as described on the previous page.

BASIC OPERATION FOR RECORDING TV PROGRAMMES



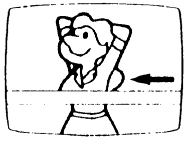
1 Turn the TV receiver on and adjust it to your video channel.

2 Load a cassette (with safety tab in place).
- Power will be switched on automatically.

3 Press either TV programme button ● to select the channel you wish to record.

4 Press the ● /DA button ❻ to start recording.
- Be careful to press ● /DA only once, or Instant Timer Recording will begin.
- Press the record ● and the play ● buttons simultaneously when using the remote control unit.
- If there is part of the programme you do not want to record, press the ▮▮ button ❿ . A white horizontal bar will appear on the screen, which reduces in size in 4 steps as time elapses. When the last quarter starts blinking and disappears, the Stop mode will be entered automatically. The pause duration is possible for about 5 minutes.

Pause mode indicator



- To continue recording from the Pause mode, press the ► /X2 button ❾ while the white bar is on-screen.

5 Press the ■ / ⏏ button ❼ at the end of the programme.
- When the end of the tape is reached during recording, the tape is automatically rewound and stops.

Notes:
- When recording is restarted from the Pause mode, assemble recording is performed so that the playback picture will not distort at the edit point.
- The selected channel cannot be altered during recording. *If you wish to change the channel, first engage the Pause* mode and then select a different channel.

INSTANT RECORDING

If you wish for recording to stop automatically after a certain period of time, use this Instant Timer Recording mode.

1. Press the ● /DA button during recording (or twice if in the Stop mode).
   - Recording will begin and the FDP shows "AUT 0:30", indicating that recording will automatically stop and power will switch off after 30 minutes.
2. Adjust the switch-off time, if necessary.
   - Press ● /DA to increase the time in 30-minute increments (possible up to 4 hours).
   - Use EINSTELLEN and AUSWAHL to set to a more precise time when required (possible up to 8 hours 59 minutes). After setting the time, press AUSWAHL so that all digits stop blinking.

RECORDING ONE PROGRAMME WHILE WATCHING ANOTHER

A programme not being viewed can be recorded while you enjoy another programme.
- Select the channel you wish to record with the recorder's channel select buttons.
- Select the channel you wish to view with the TV receiver's channel selector.

OTHER RECORDING POSSIBILITIES

RECORDING STEREO TV PROGRAMMES

(Applicable only to the West German Sound Multiplex TV system)

If stereo TV programmes are broadcast in your area, this recorder automatically receives them in stereo. When a stereo programme is being received, the STEREO indicator lights and recording is made in stereo on the hi-fi audio track and in monaural (mixed L + R) on the normal audio track. To listen to the stereo soundtrack during recording, set the AUDIO MONITOR button ● for Hi-Fi L and R. If this button is left set either in the Hi-FI L or R position, you will hear only one channel while recording, though the recording is being made in stereo.
- If the quality of the stereo sound being received is poor, set the MONO/AUTO switch ● to MONO. The STEREO indicator will go off, and the broadcast will be received in monaural with better quality.

RECORDING BILINGUAL TV PROGRAMMES

(Applicable only to the West German Sound-Multiplex TV system)

When a bilingual TV programme is being received, the 2-KANAL indicator lights. There is a switch to select the soundtrack to be recorded on the normal audio track, however, because both soundtracks are recorded always on the hi-fi track for selective listening, you can ignore the switch labelled 2-KANALTON in most cases unless you need a specific soundtrack on the normal audio track.
- Set 2-KANALTON switch ● to HAUPT to record the main soundtrack (local language); to NEBEN to record the sub soundtrack (foreign language).
- To listen to the selected soundtrack from the hi-fi audio track while recording, press the AUDIO MONITOR button for either Hi-Fi L or R.
- To listen to the soundtrack being recorded on the normal audio track, press the Hi-Fi/NORM/MIX button ● for NORM.

RECORDING FM SIMULCAST TV PROGRAMMES

FM simulcast TV programmes can be recorded using an FM stereo tuner. Connect necessary components. (Connect the FM tuner to the rear panel AUDIO EING. connectors.) Select the TV channel broadcasting the simulcast programme with the recorder's channel select buttons and tune the FM stereo tuner to the station broadcasting the soundtrack for this TV programme.

The only difference from the basic recording procedure on page 51 is an additional step after step ■.
- Press SIMUL button ● .

  Then the SIM indicator on the FDP will light. With this setting, the video and audio signals from the built-in tuner will be recorded on the video and normal audio track and the audio signal from the FM stereo tuner will be recorded on the hi-fi audio track.

Notes:
- After finishing recording, be sure to press the SIMUL button to switch back to the Tuner mode.
- While recording simulcast programmes, it might happen that the hi-fi sound distorts momentarily at switching points between different programmes. This is not due to any defect of the unit.

RECORDING A TV PROGRAMME WHILE RECORDING AN INDEPENDENT AUDIO SOURCE

Using the "simulcast" recording function, you can record independent audio and video programmes, because the TV soundtrack is not lost, but recorded on the normal audio track. While recording a TV programme, record any audio source independently.
- Connect an audio component (such as an FM tuner) to the AUDIO EING. connectors ● .
- Press SIMUL button. The SIM indicator on the FDP will light.

Notes:
- If you stop recording to avoid unwanted material of the TV programme using the ▮▮ button, the audio programme from an external source is also cut.
- If television broadcasting comes to an end during recording, the hi-fi sound being recorded from an external source may distort. It is recommended that you check the timetable of TV broadcasts in advance.
- After finishing recording, be sure to press the SIMUL button to switch back to the Tuner mode; otherwise, recording on the hi-fi audio track from the built-in tuner will not be possible.

USING THE HR-D830EG AS AN AUDIO TAPE DECK

You can record audio only (without recording any video signal) on the hi-fi audio track. This means you can record a continuous 8-hour FM programme onto a single cassette (E-240).
- Connect an audio source (such as an FM tuner) to the AUDIO EING. connectors.
- Tune the built-in tuner to a vacant channel.
- Press SIMUL button. The SIM indicator on the FDP will light.
- In the Hi-Fi LP mode, only audio signals can be recorded.

24-HOUR INSTANT TIMER RECORDING

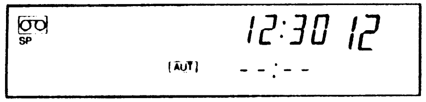
The 24-Hour Instant Timer Recording feature allows unattended automatic starting and stopping of the recording of a single programme which starts within a 24-hour period.

Preparations

1. Insert a cassette with its safety tab in place. The recorder turns on automatically.
2. Select the channel you wish to record from.

Setting the timer

1 Press the START button ● to engage the 24-Hour Instant Timer Set mode. The following information, with the current time and AUT "--:--", will appear on the FDP.



- Each pressing delays the START time by 30 minutes.

2 After reaching the desired START time, press the ● /DA button ⑥ the required number of times to set the desired length of recording time.

3 After confirming the START time and recording length, press the BETRIEB button ⑪ .

- "AUT" remains on the FDP and the 24-Hour Instant Timer Standby mode will be automatically engaged.
- If the programme has not been correctly preset, the "AUT" indicator will blink for about 10 seconds when the BETRIEB button is pressed. Recheck the programmed data.

For a More Precise Setting of Start Time and Recording Length

- After first pressing the START button once, press the AUSWAHL button ● . The hour digits for START time setting will flash.
- Set the hour with the EINSTELLEN "+/-" buttons ● , then press AUSWAHL. The minute digits will flash.
- Set the minutes with the EINSTELLEN "+/-" buttons, then press AUSWAHL. The hour digits for "AUT" setting will flash.
- Set the hour with the EINSTELLEN "+/-" buttons, then press AUSWAHL. The minute digits will flash.
- Set the minutes with the EINSTELLEN "+/-" buttons.

Notes:
- At each step of the timer setting procedure, if no time is entered within 10 seconds, the Instant Timer Set mode is cancelled, and the current time is displayed.
- To cancel the Instant Timer Set mode, press the LÖSCHEN button ● twice.
- 24-Hour Instant Timer Recording has priority over other timer programme settings; therefore, no other programmes, set for timer recording, will be recorded until 24-Hour Instant Timer Recording has been executed.

NEXT-FUNCTION MEMORY

Memory Play function

- If you want to watch the tape from its beginning after rewinding, press ◀◀ and then the ▶ /X2 button within 2 seconds. Playback will start automatically at the beginning of the tape. (Check to see that the counter memory indicator [S] is off.)
- If you want to watch the tape from the counter reading of "0St 00M 00S", press the ZÄHLWERK-SPEICHER button, then the ◀◀ (or ▶▶) button and then the ▶ /X2 button within 2 seconds.
- While the tape is being rewound, the Play (▶) indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (■ / ⏏ , ▶ /X2, ▶▶ , ◀◀).

Memory Eject/Power-Off/Timer Standby

If you are going to eject the cassette, turn the power off or engage the Timer Standby mode after rewinding the tape, you do not have to wait for completion of rewind to press the corresponding button.

- To eject the cassette after rewind, press the remote control's ◀◀ and then CASSETTE within 2 seconds. (To cancel the Memory Eject mode, press ■ .)
- To turn the power off after rewind, press ◀◀ and then the BETRIEB button within 2 seconds. (To cancel the Memory Power-off mode, press BETRIEB).
- To engage the Timer Standby mode after rewind, press ◀◀ and then the SCHALTUHR button within 2 seconds. (To cancel the Memory Timer Standby mode, press SCHALTUHR).

Memory Play	▶▶ / ◀◀	→	▶ /X2	▶	Blinking	→ Play mode
Memory Eject (from Remote Control only)	◀◀	→	CASSETTE	▭	Blinking	→ Cassette ejected
Memory Power-off	◀◀	→	BETRIEB	BETRIEB	Blinking	→ Power off
Memory Timer Standby	◀◀	→	SCHALTUHR	TIMER BETRIEB	Lights Blinking	→ Timer standby mode
		within 2 seconds				

INDEX SEARCH FUNCTION

The Index Search function gives you automatic access to locations on the tape where index codes are recorded. Index codes are recorded automatically at the beginning of recordings which are started from the Stop or Timer Standby mode, or recorded manually at any other position during recording or playback. Unnecessary codes can be erased manually during playback. In neither case is there any effect on the audio or video recordings on the tape. With this recorder, you can access any one of up to 99 of these indexed segments in either the forward or reverse direction.

Using the Index Search function

1 Press the INDEX button ● while in the Play or Stop mode.

- The channel display of the FDP will change to the Index Search mode and the "[INDX]" indicator will light.

2 Specify the index number (1 – 99) using the numeric keys ● within 10 seconds.

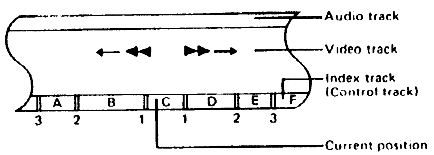
- The specified number will appear in the FDP.

3 Press either ◀◀ or ▶▶ button ● .

- The tape will move and the index numbers count down to 0, where normal playback will start.
- If the INDEX button was pressed in the Play mode, the screen will show search pictures; if the button was pressed in the Stop mode, then the index codes are detected in the much faster Rewind or Fast-Forward mode.

Notes:
- To cancel the Index Search mode before completion, press the ▶ /X2 ● or ■ button ● .
- If the end of the tape is reached while still in the Index Search mode, the mode is cancelled and the tape rewound.

Tips for specifying the index number



- "1" + ▶▶ moves playback to the beginning of segment D.
- "1" + ◀◀ moves playback to the beginning of segment C.
- "2" + ◀◀ moves playback to the beginning of segment B.
- If no number is entered, a value of "1" is assumed.

Changing the index codes

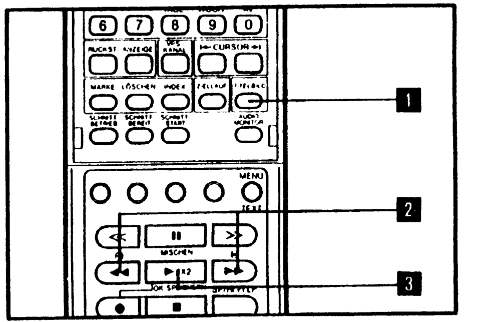
Mark button ● (MARKE)
In the Play or Record mode, press this button once to put an index code onto the tape. "INDX" appears on the FDP and blinks during the marking process.

Erase button ● (LÖSCHEN)
In the Play or Still mode, press this button to erase the next index code. The tape is automatically fast-forwarded and when an index code is detected, it will be erased automatically. "INDX" remains lit on the FDP during the searching process and blinks during the erasing process.

Notes:
- Index codes cannot be added or erased on a tape with its safety tab removed.
- The Erase mode is cancelled either after one index code has been erased or the Play mode is cancelled.

INTRO SEARCH FUNCTION

The Intro Search function lets you visually check the contents of each recording by playing back in fast motion a short segment of a programme each time an index code is detected.



1 Press the TITELBILD button ● while in the Play or Stop mode.

- The INDX indicator on the FDP will light.

2 Press the ◀◀ or ▶▶ button ● within 2 seconds.

- The Intro Search will start in the corresponding direction.
- Each time an index code is detected, the corresponding part is played back in the Search mode (9 times normal) for about 5 seconds.

3 When you find the section you want to view, simply press the ▶ /X2 button ● .

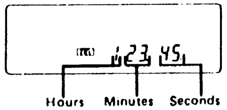
- Normal playback will start.

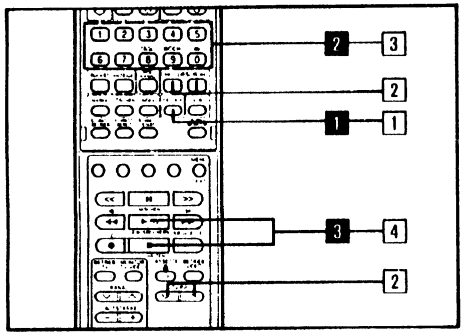
REALTIME TAPE COUNTER

Unlike usual tape counters which show tape locations in numbers, this realtime tape counter shows tape time precisely in hours, minutes and seconds in all modes (Record, Play, Rewind, Fast Forward).

Time Go-To function

The time Go-To function gives you direct access to any point on the tape by simply specifying the time from the beginning of the tape.





1 Press the ZIELLAUF button (55) while in the Play, Stop or Still mode.
- The counter will change to the Go-To mode.

2 Specify the time (from the beginning of the tape) to the point to be located, by using the numeric keys ㊼ .

3 Press the ▶ /X2 ● or ■ button ● .
- Always key in a full number.
- Depending on the situation, search will take place either in the Shuttle Search mode or in the Rewind or Fast Forward mode which is much faster than the Shuttle Search mode. After the specified point is reached, playback starts automatically or the tape stops automatically depending on the command.

Pressing ▶ from Play or Still mode:	Shuttle Search – Automatic start of playback
Pressing ▶ from Stop mode:	◀◀ or ▶▶ – Automatic start of playback
Pressing ■ from Play, Still or Stop mode:	◀◀ or ▶▶ – Automatic stop

- If the recorder did not detect the leader tape when the cassette was loaded (indicated by "St --M --S" when the ZIELLAUF button is pressed), the tape is first rewound to the beginning of the tape and then is fast-forwarded to the specified point.

Time Search function

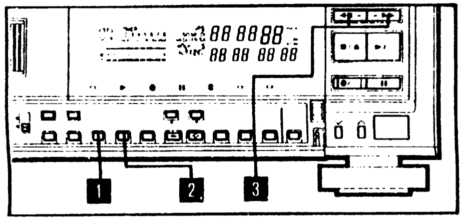
The Time Search function lets you locate a point on the tape a specified time span away from the current position in either direction.

[1] Press ZIELLAUF while in the Play, Stop or Still mode.
[2] Press the CURSOR ⇤ / ⇥ (51) or TV PR. ∨ / ∧ buttons (71) to specify the direction of search.
[3] Specify the time (from the current position) to the point to be located, by using the numeric keys.
[4] Press ▶ /X2 or ■ .

- The tape will move to the specified point and automatically start playback or stop.

Notes:
- Each step in the operation procedure must be followed by the next within 60 seconds, otherwise the Go-To or Search mode will be cancelled.
- If the ZIELLAUF button was pressed in the Play or Still mode, when the specified point is reached, a still picture will be displayed as a result of having pressed the ❚❚ button instead of ▶ or ■ , after having keyed in the time.
- Use of other control buttons, while in either the Time Go-To or Search mode, cancels that mode.
- If the specified time exceeds the tape length, the tape fast forwards to the end and then rewinds to the beginning and stops.

COUNTER MEMORY FUNCTION/LAP TIME INDICATION



Counter Memory function

1 Press the ZÄHLWERK-RÜCKST. button ㉖ at a point which you may wish to locate later.
- The counter will read "0St 00M 00S".

2 Press the ZÄHLWERK-SPEICHER button ㉗ . [S] will appear in the FDP.

3 Press the ◀◀ (or ▶▶) button ❽ when you need to return to the designated point.
The tape will rewind (or fast forward) and stop at about the "0St 00M 00S" counter reading automatically.

Lap Time Indication

When you need to know the exact time of a recording, press the ZÄHLWERK-RÜCKST. button before starting recording or playback. The counter will be reset to "0St 00M 00S" and show the exact elapsed time as the tape runs.

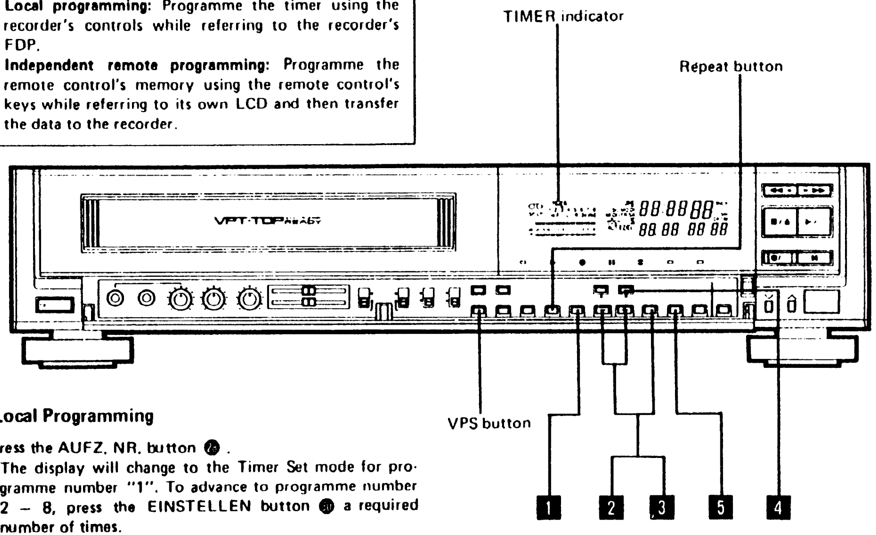
AUTOMATIC TIMER RECORDING

First of all, load a cassette (with safety tab in place); power will be switched on automatically.

Two ways to perform timer programming

A. **Local programming:** Programme the timer using the recorder's controls while referring to the recorder's FDP.

B. **Independent remote programming:** Programme the remote control's memory using the remote control's keys while referring to its own LCD and then transfer the data to the recorder.

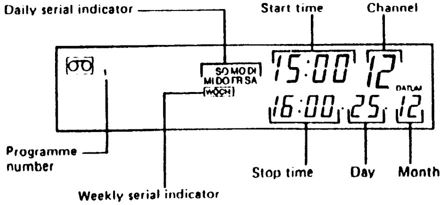


A. Local Programming

1 Press the AUFZ. NR. button ● .
- The display will change to the Timer Set mode for programme number "1". To advance to programme number 2 – 8, press the EINSTELLEN button ㉚ a required number of times.

2 Set the start time by using the AUSWAHL ㉜ and EINSTELLEN buttons ● .
- Select the item to be set with the AUSWAHL button; the selected item will blink.
- Set the desired data with the EINSTELLEN -/+ buttons.
- To record a weekly serial, press the WÖCH.button ㉘ once.
- To record a daily serial starting on a certain day, press WÖCH. twice.

3 Set the stop time, date and channel in succession in the same way as for setting the start time.
- To record a daily serial starting on the day of setting, there is no need to enter any date figure; simply advance to the next item.
- When not using the VPS recording system, before setting the channel, press the VPS button to make "VPS" disappear.
- For programming the timer to record an external source, while the channel position is blinking, press EINSTELLEN -/+ until the "AU" indicator appears in the channel display section on the FDP.



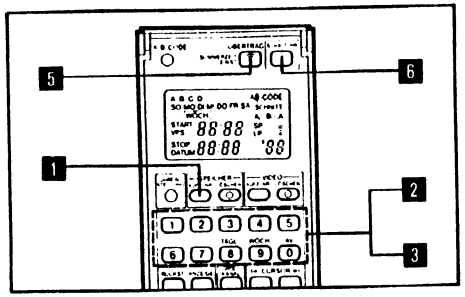
- For programming the timer to record an FM simulcast programme, press the SIMUL button ㉙ on the recorder at any stage while programming; "SIM" will appear on the FDP.

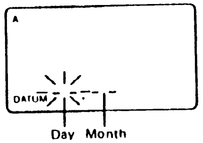
4 Press the SP/Hi-Fi LP button ㉛ to obtain the desired recording mode indication on the display.
- The SP or Hi-Fi LP entry can be made anytime while in the Timer Set mode.

5 After making sure that the cassette is loaded, press the SCHALTUHR button ㉝ .
- The Timer Recording Standby mode will be engaged with the TIMER indicator and the preset programme number(s) illuminated and the power turned off.
- With no cassette loaded, the TIMER and "cassette loaded" indicators will continue blinking.
- A cassette whose safety tab has been removed will be ejected automatically.
- If a preset programme contains errors, that programme number will not be illuminated. Recheck the programmed data.

B. Independent Remote Programming

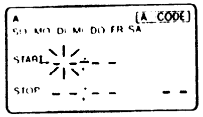
- The remote control incorporates 4 programme memories (A, B, C and D).
- The programmed data is held in memory even after it has been transferred to the recorder.



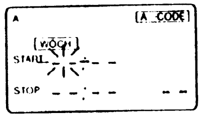


1 Press the SPEICHER AUFZ. NR. button ⑫ .
- The LCD will be activated for programme memory "A".
- To advance to programmes B to D, press again.

2 Enter the date using numeric keys ⑰
- Invalid numbers will be rejected.
- To record a daily serial starting on the day of setting, press the CURSOR key "→|" (51) without entering any date figure.
- To record a daily serial starting on a certain day, press [8] and enter the date.
- To record a weekly serial, press [9] and enter the date.

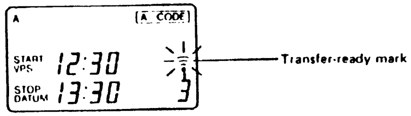


For daily serial setting



For weekly serial setting

3 Enter the start time, stop time and channel in succession.
- To key in a one-digit number of hours or minutes, first press [0] . Then press the relevant numeric key.
- When not using the VPS recording system, before setting the channel, press VPS to make "VPS" disappear.
- For programming the timer to record an external source, press the numeric key "0" while the channel is blinking: "AU" will appear on the LCD. When transferred in step **5**, "AU" will appear in the channel display section on the FDP.
- After the channel has been entered, the transfer-ready mark will appear and blink.



4 Press the SP/H-Fi LP button ⑱ to obtain the desired recording mode indication on [illegible]
- The SP or Hi-Fi LP [illegible] [illegible]ytime while in the Timer Set mode.

5 Direct the remote control to the recorder's Remote Sensor window ● and press the UBERTRAG button ● .
- The programmed data will be loaded in one of the recorder's memories (1 – 8), the vacant one of the smallest programme number.
- If all programme memories are full, the recorder's clock will blink and transmission will not take place.
- Call up the programme(s) to be cancelled by pressing the VIDEO AUFZ. NR. button ● , then press the VIDEO LÖSCHEN button ● to cancel it. Data transfer can now be made by pressing ÜBERTRAG again.

6 Press the SCHALTUHR button ● .
- Check to see that the TIMER indicator and other items on the recorder's FDP respond correctly. See page 56.

How to use the CURSOR keys (|←/→|) (51)
- If you press a wrong key and the flashing position has advanced, press |← to return to the previous position for correction.
- Once all data have been programmed, you can reach any position for correction using |← or →|. The flashing position is ready for re-entry.
- Pressing the SPEICHER AUFZ. NR. button ⑫ on the remote control engages the LCD in the transfer-ready mode in which the transfer-ready mark is flashing and data correction is not possible. For correction of data, press either cursor key to move to the position which requires correction.

Setting the date, start and stop times, and channel

- It is not possible to set the date, start and stop times unless the date and clock have previously been set.
- Enter the data while the digits are blinking.
- The stop time can be set within 24 hours from the start time.
- Non-applicable numbers (such as January 32, February 30 for dates, 24 or larger for hours, 60 or larger for minutes and 49 or larger for channels) will be rejected when keyed in.

Cancelling the preset data

- The preset programmes can be cancelled. First engage the Timer Set mode for the programme number you wish to cancel and then press the LÖSCHEN button ● or the VIDEO LÖSCHEN button ● . Or for the remote control's memory, press the SPEICHER LÖSCHEN button ● .
- An executed programme is automatically cleared.

Checking the programmed data

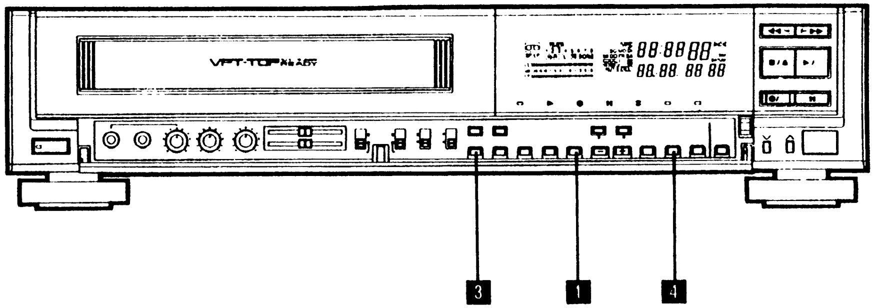
- C[illegible]ing can be performed anytime, even after the SCHALTUHR button has already been engaged. To do this, press AUFZ. NR. ● while in the Timer Standby mode. The programme number will blink on the FDP and you can check each programme by advancing programme numbers with the EINSTELLEN buttons ● . If re-programming is required, disengage the Timer Standby mode and use the regular programming method. Pressing the AUFZ. NR button ● and/or EINSTELLEN buttons ● engages the FDP in the check mode in which no position flashes and data correction is not possible. For correction of data, press the AUSWAHL button ● and move the cursor to a position which requires correction.

Timer recording operation

- When the preset start time is reached, recording starts.
- After timer recording, the power is switched off. If the tape end is reached during timer recording, the cassette is automatically ejected and the power is switched off.

VPS RECORDING

In the VPS (Video Programme System) system, TV stations transmit different VPS codes for different TV programmes, which control the starting and stopping of the video recorder and have precedence over times preset in the timer for accurate recording of a particular programme from start to finish.

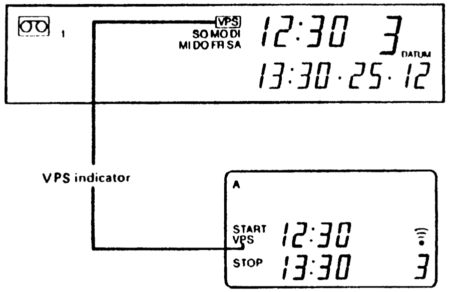


1 Press the AUFZ. NR. button ● (or the VIDEO AUFZ. NR. button ●) or, for the remote control's memory, the SPEICHER AUFZ. NR. button ⑫ .

2 Set the date, start time, stop time and channel in the same way as for timer programming.

3 Press the KANAL EINSTELLUNG ● or the VPS/KANAL button ● .
- All timer data will be converted to VPS codes and stored in memory.

4 Press the SCHALTUHR button ● or ● .
- The recorder will enter the VPS standby mode at 20:00 on the day previous to the preset day and remain engaged until 3:59 on the following day, if the intended programme has not yet been broadcast.
- When a VPS code corresponding to the intended TV programme is detected during the VPS standby mode, recording will start. When the VPS code changes to another, recording will stop.
- When an interruption code is detected during VPS recording, the VPS standby mode is engaged and recording restarts when the regular VPS code is restored.



Note:
- Operation at the end of VPS recording is the same as with ordinary timer recording.

AUDIO DUBBING

Audio dubbing means recording a new soundtrack on a pre-recorded tape. In other words, the previously recorded sound is erased and replaced with a new soundtrack. **Audio dubbing is applicable only to the longitudinal audio track (normal audio).** Therefore, a dubbed narration can be heard together with the original hi fi sound.

1. Switch on the TV receiver.
   - Adjust the TV receiver's channel to your video channel.
2. Load a pre-recorded cassette. Power will be switched on automatically.
3. Connect a microphone to the MIKROFON-EING. jack ⑬ .
4. Be sure that the MIKROFON-MIX control ● is set to the appropriate level when required. Connect a pair of headphones to monitor this sound level adjustment.
5. Press ▶ /X2 ⑨ to start playback and then press ◀◀ or ▶▶ ⑧ to search for the point from which you wish to start audio dubbing.
6. Press ❚❚ ⑩ at the start point of audio dubbing.
7. Press VERTONUNG ● .
8. Press ▶ /X2.
   - Audio dubbing will start.

Notes:

- If whistling or howling is heard during audio dubbing, reduce the TV volume or move the microphone farther away from the TV. Recording is being performed even if sound is not heard from the TV receiver. If you want to monitor the sound being recorded, connect headphones to the KOPFHÖRER jack.
- Marking index codes is not possible while audio dubbing is being performed.

CAUTION:
Audio dubbing is not possible with an audio source connected to the rear panel AUDIO EING. connectors.

RECORDING FROM AN EXTERNAL SOURCE

By connecting an external video source (such as a 2nd video recorder, VideoMovie camera-recorder, etc.) to the AUDIO/VIDEO socket, editing is possible.
- For connection of these units an appropriate cable is necessary.

Connection

1. Connect the AUDIO/VIDEO socket ⑰ to the appropriate audio/video output of the 2nd video recorder.
2. Connect a TV receiver to the recorder to monitor the picture while recording.

Operation

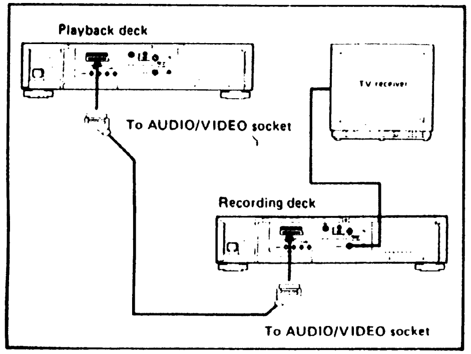
1. Turn the power on for all connected equipment.
2. Tune the TV receiver to your video channel.
3. Load a cassette with its safety tab in place.
4. Press either TV programme button ㉟ or the numeric key 0/AV ⑰ to obtain "AU" in the channel display section on the FDP.
5. Press the ● /DA button ⑥ and the ❚❚ button ⑩ to put the recorder in the Record Pause mode.
6. Play back a tape on the source equipment to determine the segment to be recorded.
7. Press the ▶ /X2 button ⑨ to start recording.
8. To stop recording temporarily, press the PAUSE/STANDB. button.
9. To end recording, press the ■ / ⏏ button ⑦.

Note:
- For the operation of the source equipment, refer to the instruction manual of the relevant machine.

Editing from a VideoMovie

This recorder is equipped with a remote PAUSE FERNBEDIENUNG terminal. When the recorder is connected to a VideoMovie which incorporates a Master Edit Control system, you can control the recorder with the VideoMovie's controls for making edits free of transition-point gaps and distortion. Refer to the VideoMovie's instruction manual for detailed operating procedures for editing.

Note:
- For direct recording with a video camera, a camera adapter is also necessary.



DUET EDITING

DUET EDITING

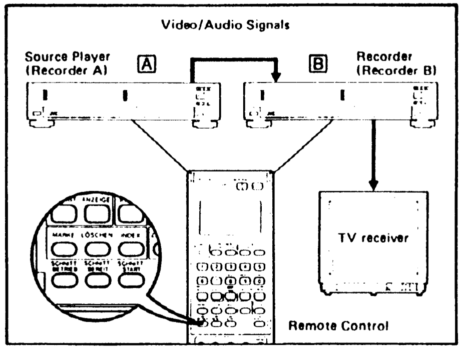
Designed specifically to simplify editing operations, the Duet Editing function delivers separate commands to two recorders simultaneously via a single remote control, taking advantage of the A/B code system. (JVC dedicated models only.)

Preparations

- Connect two recorders as described in "RECORDING FROM AN EXTERNAL SOURCE" on the previous page.
- Set one recorder to respond to A code signals, the other, to respond to B code signals. (See page 39.)
- Place the two recorders side by side.

Notes:

- JVC video recorders with infrared remote control units which are not equipped with an A/B-CODE select switch are designed to receive A-code signals. Therefore, Duet Editing is possible with JVC decks if the HR-D830EG is set to respond to B-code signals.
- It is not possible to perform Duet Editing unless the remote control's clock has been previously set.



OPERATION

Remote Control	Recorder A (Source player)	Recorder B (recorder)
	Load a recorded tape.	Load a blank tape.
1. Press SCHNITT-BETRIEB. "SCHNITT [A] → [B]" appears on LCD.		
2. Press SCHNITT-BEREIT.	Enters STILL mode.	Enters RECORD-PAUSE mode.
3. Search for an edit-in point on the source tape. Press ❚❚ .	Functions as commanded. (In this state, only recorder A responds to the remote control's commands.)	Remains in RECORD-PAUSE mode.
4. Press SCHNITT-START.	Enters PLAY mode.	Enters RECORD mode.
5. Press ❚❚ .	Enters STILL mode.	Enters RECORD-PAUSE mode.
6. Repeat steps 3, 4 and 5 to continue editing.		

Notes:

- You can use Recorder B (the recorder set to respond to B code signals) as a source player and Recorder A as a recorder. In this case, press the A/B-CODE button in step 1 to obtain "SCHNITT [B] → [A] " indication.
- To cancel the Duet Edit mode and return to normal remote control functions, press the SCHNITT-BETRIEB button so that the SCHNITT indication disappears.
- When the SCHNITT-START button is pressed, it may take up to about 5 seconds before editing starts.

IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . . .

POWER AND TAPE TRANSPORT PROBLEMS

Symptoms	Check points
No power is applied to the recorder.	● Is the power cord disconnected? – Connect it.
Clock is functioning properly, but the recorder cannot be powered.	● Is the TIMER indicator lit on the FDP? – Press SCHALTUHR to disengage the Timer Recording Standby mode.
Tape does not run during recording.	● Is the ▮▮ button engaged? – Press the ▶/X2 button.
Tape stops in the Rewind or Fast-Forward mode.	● Is the ZÄHLWERK SPEICHER switch set so that [S] appears on the FDP? – Press to make [S] disappear.
Tape will not rewind or fast forward.	● Is the tape already fully rewound or fast forwarded? – Check the cassette.

RECORDING PROBLEMS

Symptoms	Check points
Recording cannot be started.	● Is a cassette loaded? ● Is the [illegible] tab on the cassette removed? – Reseal the slot with cellophane tape.
Camera recording is not possible.	● Are the camera and the camera adapter correctly connected? ● Is the power switch of the camera adapter set to ON? ● Does the channel display indicate "AU"? – Press "0/AUX".
[illegible]icast recording is not possible.	● Has the SIMUL button been pressed? – Press it so "SIM" appears on the FDP. ● Is an audio source correctly connected to the AUDIO EING. connectors? – Check connections.
Timer recording is not possible.	● Have you set the clock correctly and programmed the timer correctly? – Check once again. ● Is the TIMER indicator lit on the FDP? – Press SCHALTUHR.

PLAYBACK PROBLEMS

Symptoms	Check points
Playback picture does not appear while the tape is running.	● Is the TV receiver's channel selector set to the correct video channel? – Set it to the RF converter channel. (See page 41.)
Noise appears during playback.	● Press SPURLAGE buttons. (See page 49.)
Playback picture is blurred or interrupted while TV broadcasts are clear.	● Video heads may be dirty. – Head cleaning is necessary. Consult your JVC [illegible]

HI-FI AUDIO PROBLEMS

Symptoms	Check points
TV sound cannot be recorded on hi-fi audio track.	● Has the SIMUL button been pressed? – Press it again so "SIM" no longer appears on the FDP.
Soundtrack on the hi-fi audio track cannot be reproduced.	● Is the NORM indicator lit? – Press the Hi-Fi/NORM/MIX button for Hi-Fi, L and R to light as required.

OTHERS

Symptoms	Check points
Whistling or howling is heard from TV.	● Move camera or microphone away from TV or reduce TV sound volume.
Some channels are skipped over when selecting a channel.	● Those channels are preset to be skipped over. If you need them, restore them. (See page 48.)
Channel cannot be switched.	● Is recording in progress? – Press ▮▮ , select a desired channel and press ▶/X2.
The recorder cannot be operated with the remote control.	● Is the AB-CODE indicator showing the proper code for the recorder being operated? – Press the A/B-CODE button to switch the remote control to the correct setting.

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV programme received is clear. This does not mean that the recorded programme has been erased.
- Dirt accumulated on the video heads after long periods of use causes such problems. In this case, head cleaning requiring highly technical care is necessary.

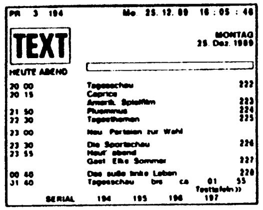
For head cleaning, consult your JVC dealer.

TELETEXT COMPATIBILITY

Teletext services are becoming popular and a vast number of teletext pages are now available for a variety of information. This recorder is ready to take advantage of these services, not only for simple viewing but also for programming the recorder's built-in timer in an extremely easy way. All you need to do is connect the optional VPT or VPV adapter to the rear of the recorder. Then the recorder's remote control exhibits its full capability with all the dual- or triple-function control keys working as intended. The following information shows examples of using the optional VPV adapter.

TELETEXT

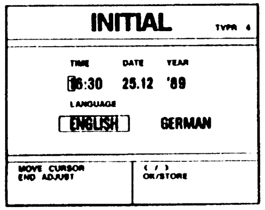
- ●View broadcast teletext pages.
- ●Several page access modes are available for quick and convenient viewing.
- ●Programme the timer using TV schedule pages.



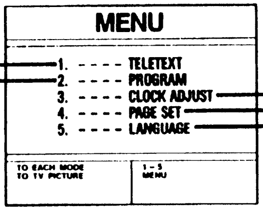
```
PR  3  194                Mo. 25.12.89  16:05:48

TEXT                                 MONTAG
                                25. Dez. 1989
HEUTE ABEND
20 00      Tagesschau                     222
20 15      Caprice
           Amerik. Spielfilm              223
21 50      Plusminus                      224
22 30      Tagesthemen                    225
23 00      Neu: Parteien zur Wahl
23 30      Die Sportschau                 226
23 55      Heut' abend
           Gast: Elke Sommer              227
00 40      Das süße linke Leben           228
01 40      Tagesschau   bis   ca   01   55
                                Testtafeln >>
      SERIAL     194     195     196     197
```

CLOCK ADJUST

- ●Set the VCR's clock manually with 10-key input.



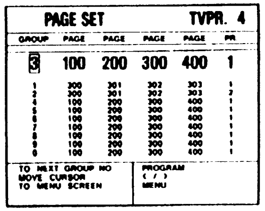
```
                INITIAL          TVPR 4

          TIME      DATE    YEAR
          16:30     25.12   '89
          LANGUAGE
       [ ENGLISH ]     GERMAN

 MOVE CURSOR          ( / )
 END ADJUST           OK/STORE
```



```
                 MENU

        1. ---- TELETEXT
        2. ---- PROGRAM
        3. ---- CLOCK ADJUST
        4. ---- PAGE SET
        5. ---- LANGUAGE

 TO EACH MODE          1 - 5
 TO TV PICTURE         MENU
```

PAGE SET

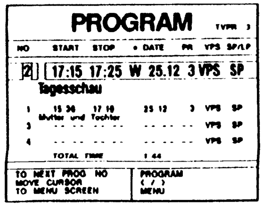
- ●Preset teletext pages so that you can quickly access your favourite or frequently-referred-to pages.
- ●Four pages can be preset for each of the keys, 0 to 9, totalling 40 pages.



```
     PAGE SET                 TVPR. 4
 GROUP  PAGE  PAGE  PAGE  PAGE  PR

  [3]   100   200   300   400   1

   1    300   301   302   303   1
   2    300   301   302   303   2
   4    100   200   300   400   1
   5    100   200   300   400   1
   6    100   200   300   400   1
   7    100   200   300   400   1
   8    100   200   300   400   1
   9    100   200   300   400   1
   0    100   200   300   400   1

 TO NEXT GROUP NO      PROGRAM
 MOVE CURSOR           ( / )
 TO MENU SCREEN        MENU
```

PROGRAM

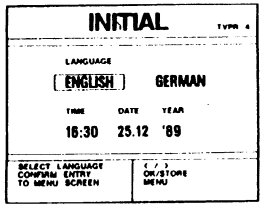
- ●Check the timer recording data on the colour display.
- ●Programme the timer manually with 10-key input.



```
              PROGRAM           TVPR 3
 NO    START  STOP   • DATE   PR  VPS  SP/LP
 [2] [ 17:15  17:25  W 25.12  3   VPS  SP
     Tagesschau
 1     15 36  17 10    25 12   3  VPS  SP
     Mutter und Tochter
 3     -- --  -- --    -- --  --  VPS  SP
 4     -- --  -- --    -- --  --  VPS  SP
       TOTAL TIME      1 44

 TO NEXT PROG NO       PROGRAM
 MOVE CURSOR           ( / )
 TO MENU SCREEN        MENU
```

LANGUAGE

- ●Select either English or German for on-screen messages.



```
                INITIAL          TVPR 4

          LANGUAGE
       [ ENGLISH ]     GERMAN

          TIME      DATE    YEAR
          16:30     25.12   '89

 SELECT LANGUAGE       ( / )
 CONFIRM ENTRY         OK/STORE
 TO MENU SCREEN        MENU
```

SECTION 1
MECHANISM ADJUSTMENTS

1.1 PRECAUTIONS

1. Disconnect mainframe from AC power before soldering.
2. Avoid imparting stress to wires when disengaging connectors.
3. Determine and correct the cause of difficulty before proceeding to adjustments. Do not disturb settings unnecessarily.
4. Use care not to damage tabs, claws, etc. during repairs.
5. Install the cassette housing assembly only when the mechanism is in the Eject or Stop mode position. In the Eject mode, the internal holder of the housing is fully raised. This is fully lowered in the Stop mode.
6. When installing the front panel assembly, be sure to engage the housing door with the door lever of the cassette housing assembly. If this is omitted, the door will not open at Eject and the cassette cannot be removed.

1.2 CHECK WITHOUT CASSETTE HOUSING

Mechanism operations can be observed easily by removing the cassette housing assembly. Note the following.

1. Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
2. Connect pins 2 and 3 of Main board connector CN601.
3. Select the desired modes with the operation buttons. However, notice that without tape, setting for the reverse direction modes produces the Stop mode after a few seconds due to absence of the reel sensor output.

1.3 MANUALLY REMOVING CASSETTE TAPE

In event of electrical system failure that prevents the tape from being unloaded, the tape can be removed manually by the following procedure. Refer to Figs. 1-6-1, 1-6-2 and 1-6-3.

1. Disconnect power cord from AC outlet.
2. Turn the loading motor by hand so that the control cam rotates clockwise. This retracts the pole base assembly to the unloading position.
3. Continue turning to where the guide arm and half loading gear assemblies shift to beneath the cassette.
4. Turn the clutch assembly at the rear of the deck to absorb slack tape within the cassette.
5. Again turn the loading motor in the same direction to raise the cassette and remove it.

1.4 TEST EQUIPMENTS

The following special tools and fixtures are required for mechanism adjustment.

1. Alignment tapes : MH-2
   Stairstep signal is employed for interchangeability checks and adjustments.
2. Torque gauge : PUJ48075-2
   Measures tape take-up torque.
3. Back tension cassette gauge : PUJ48076-2
   Measures tape tension at the supply side.
4. A/C head positioning tool : PUJ47351-2
   Shifts the head base for adjusting the control head position.
5. Roller driver : PTU94002
   Turns the guide roller for adjusting FM linearity.

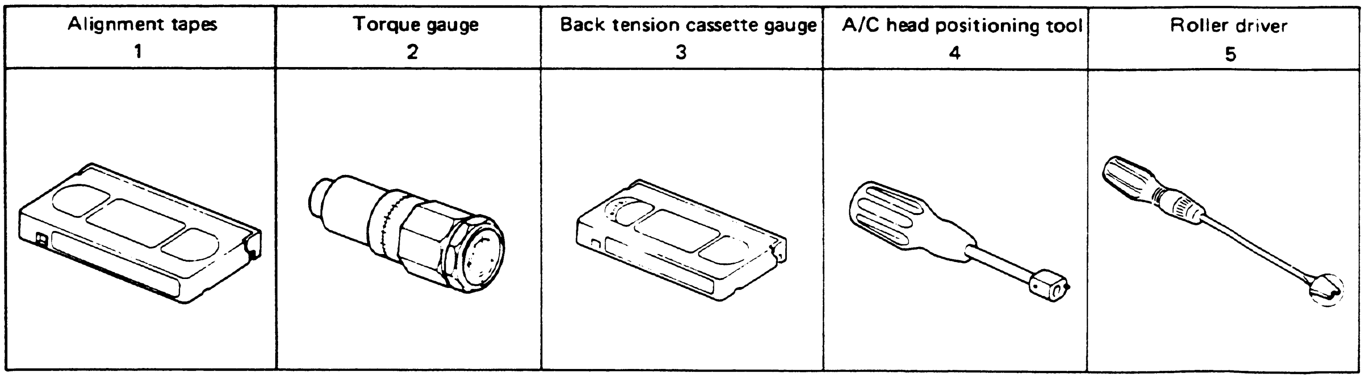


Fig. 1-4-1 Test equipments

1.5 DISASSEMBLY

1.5.1 Top cover

1. Refer to Fig. 1-5-1 and set for the EJECT (Stop) mode and disconnect VCR from AC power.
2. Take out 4 screws Ⓐ and 1 screw Ⓑ. To remove the top cover, slide it in the direction of the arrow and lift it away.

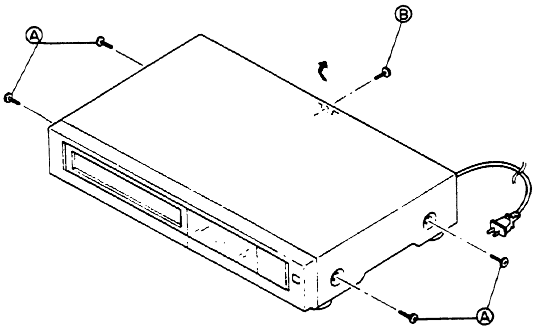


Fig. 1-5-1

1.5.2 Front panel assembly

1. Remove the top cover.
2. Carefully disengage 3 tabsⒸof the front panel assembly from the upper side of the chassis.
3. Refer to Fig. 1-5-2 and pull the front panel assembly forward you to disengage 3 tabs Ⓓ of the front panel assembly from the bottom side of the chassis, then remove the front panel assembly.

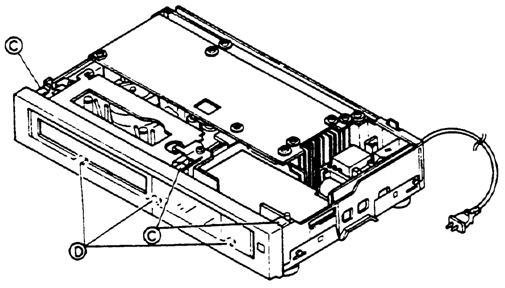


Fig. 1-5-2

1.5.3 Bottom cover

1. Remove the top cover.
2. Refer to Fig. 1-5-3 and take out 4 screws Ⓔ and 2 screws Ⓕ from the bottom of the chassis.
3. Disengage the bottom cover from 4 claws Ⓖ on the bottom of the chassis.

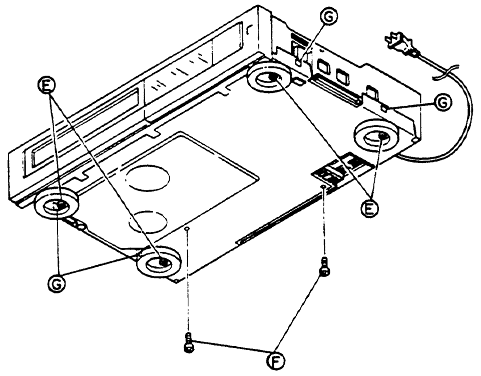


Fig. 1-5-3

1.5.4 Main board assembly

1. Remove the top cover.
2. Refer to Fig. 1-5-4 and take out 5 screws Ⓗ and 1 screw Ⓘ from main board assembly.

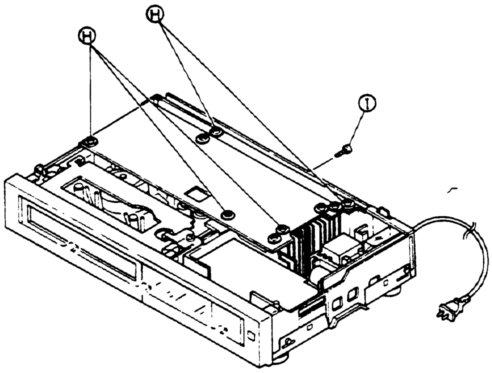


Fig. 1-5-4

1.5.5 Cassette housing

1. Remove the top cover and main board assembly.
2. Refer to Figs. 1-5-5 and 1-5-6.
   Take out 4 screws Ⓙ that secure the cassette housing. Disengage 3 tabs Ⓚ of the front panel and pull the front panel forward where it does not interfere with removing the cassette housing.
   Remove the cassette housing in the upward direction.

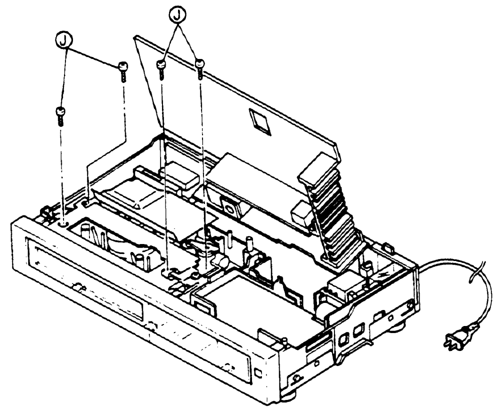


Fig. 1-5-5

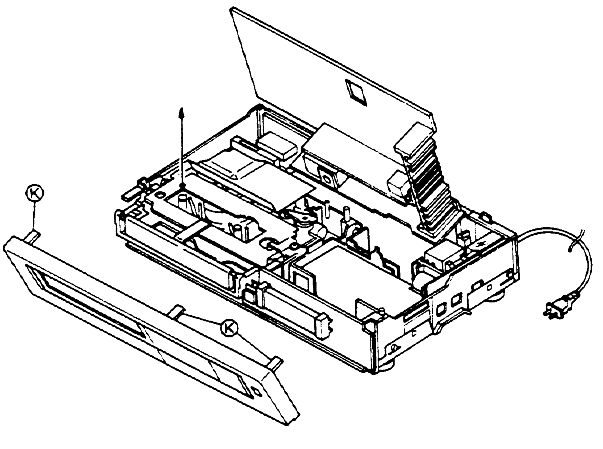


Fig. 1-5-6

1.5.6 Cassette housing installation

1. On the main deck, observe the positional relationships of the parts indicated in Fig. 1-5-7.
   If necessary, turn the loading motor by hand to obtain these positions.

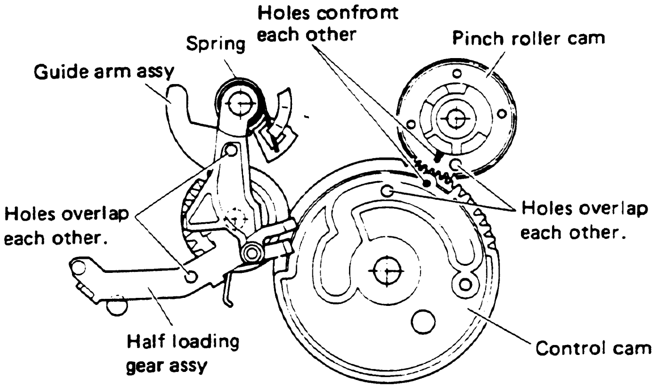

Holes confront each other
Spring
Pinch roller cam
Guide arm assy
Holes overlap each other.
Holes overlap each other.
Half loading gear assy
Control cam

Fig. 1-5-7

2. Refer to Fig. 1-5-8 and confirm that the clutch is engaged.
   If necessary, press the lever indicated by the arrow to where the clutch is locked.

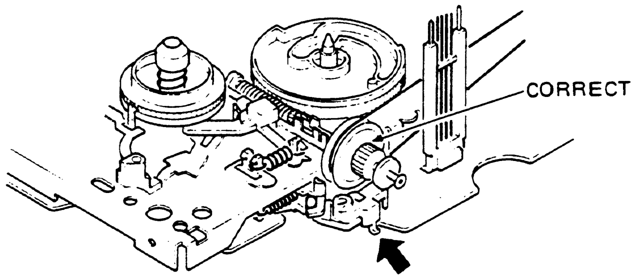


Fig. 1-5-8

3. Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position).
   Set the cassette housing into place and secure with 4 screws.
4. Install the front panel as shown in Fig. 1-5-9 and re-engage the tabs. Supply power and use a spare cassette to check for normal loading and eject operations.

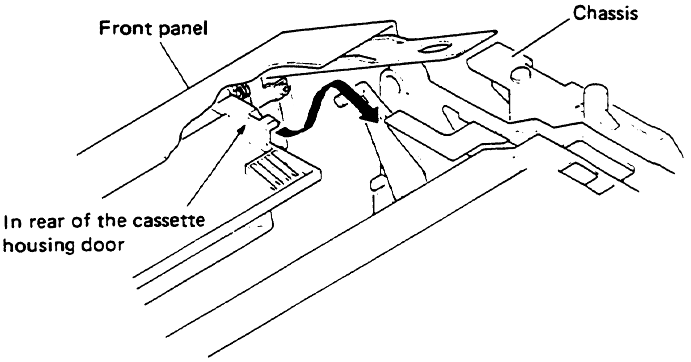

Front panel
Chassis
In rear of the cassette housing door

Fig. 1-5-9

5. Disconnect VCR from power, then reinstall the main board assembly and top cover.

1.5.7 Cassette housing door

1. Remove the top cover and front panel assembly.
2. Take out one screw Ⓛ of the front panel assembly.
3. Refer to Fig. 1-5-10 and use care regarding the torsion spring, then pull out the right end of the cassette housing door to move it.

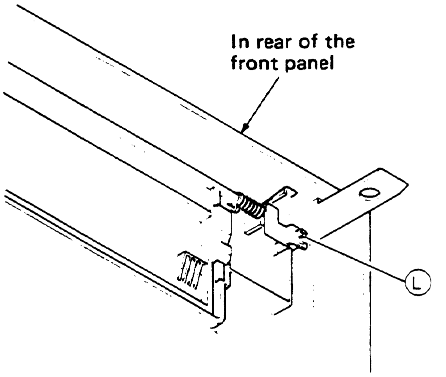


Fig. 1-5-10

1.5.8 Main-deck

1. Remove the top cover, front panel assembly and main board assembly.
2. Refer to Fig. 1-5-11 and take out 3 screws Ⓜ from the main-deck assembly.
3. Remove the main-deck assembly in the upward direction and disconnect a connector of CN601 from the Main board, connectors of CN1, CN2 from the Pre/Rec board, connectors of CN1, CN2 from the A/C head board, a connector of CN1 from the Loading MDA board and a connector of CN1 from the Drum MDA board.

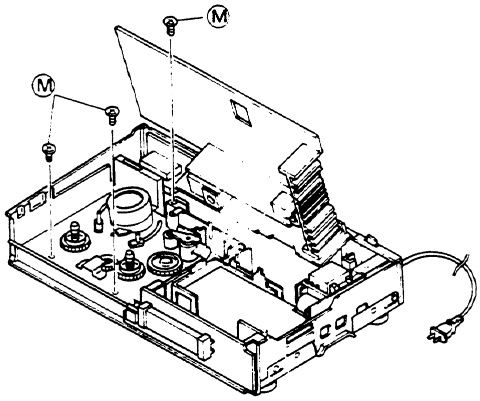
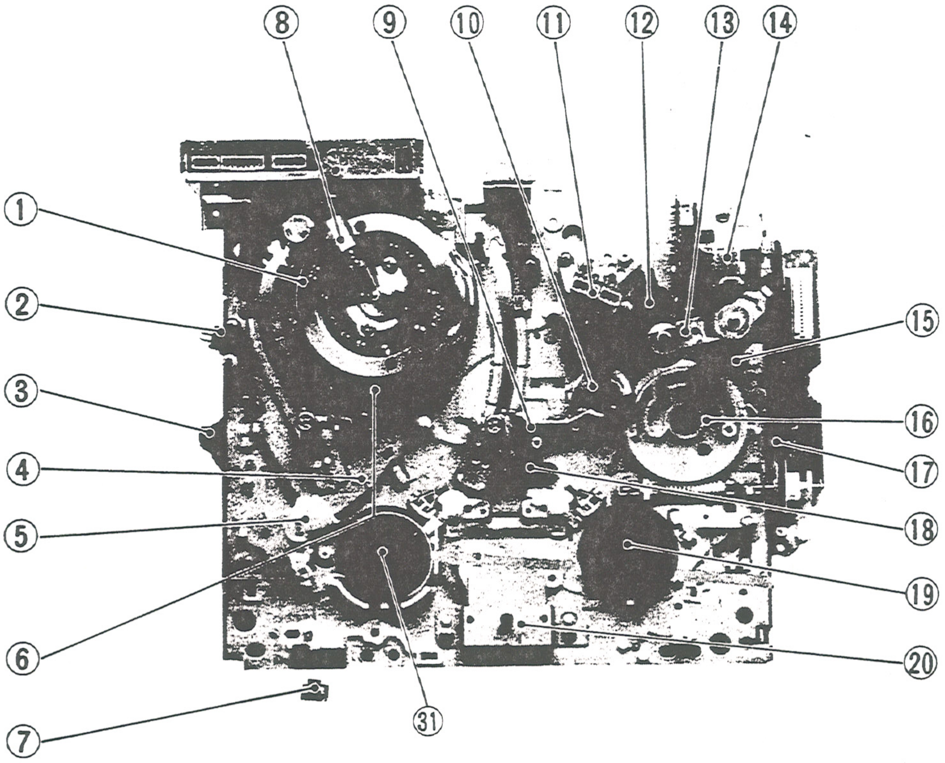


Fig. 1-5-11

1.6 MAIN MECHANISM PARTS


⑧
⑨
⑩
⑪
⑫
⑬
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㉛

Fig. 1-6-1 Top view of main-deck

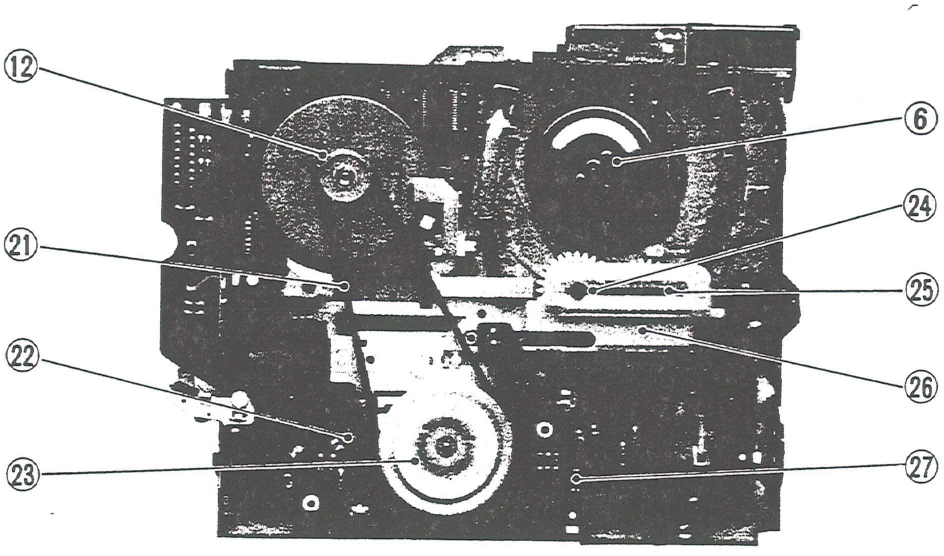


Fig. 1-6-2 Bottom view of main-deck

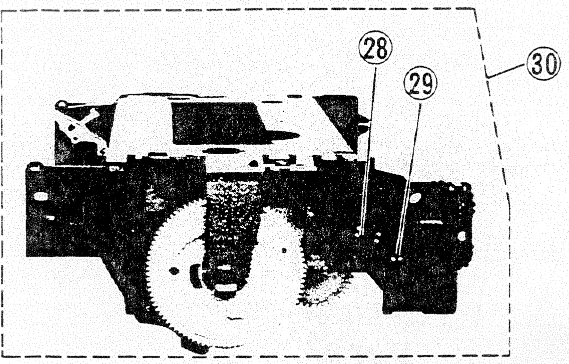


Fig. 1-6-3 Side view of cassette housing

A. Cleaning

Periodic cleaning of the tape transport system is desirable, but ordinarily not feasible in practice. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Heavy Contamination of the video heads, tape guides and brushes can detract from playback picture quality and in extreme cases, even damage the tape. For cleaning, use a fine-mesh cotton cloth (about the texture of a white dress-shirt) moistened in alcohol.

- To clean the video heads, press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
  Do not use a vertical stroke, as this may damage the heads.

B. Lubrication

Oil and grease do not require periodic replenishing. Apply only when replacing lubricated parts (also clean and replace lubrication of mating parts if soiled).

1. Table 1-6-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part Name	Part number
Oil	Video Oil	COSMO-HV56
Grease	Video Grease	KANTO-G-31KAV

Table 1-6-1

2. Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

Note: Stir grease that has been stored for an extended period.

C. Main mechanical parts

See Figs. 1-6-1, 1-6-2 and 1-6-3.

No.	Exploded view Ref.	Parts Name	See Item
1	PDM2112B/M32A	Upper drum assy	1.8.1
2	PU60616/M44	Full erase head	
3	PU60625/51Q1	End sensor	
4	PQ43497A/M41	Tension arm assy	1.8.4
5	PQ43501A-7/M42	Tension band assy	1.8.4
6	PDM2108J/M32C	Lwr drum motor assy	1.8.2
7	PU60624-1-2/M461	REC safety switch	
8	PDM4181A-3/M32D	Brush assy	
9	PQ43570A/M449	Half loading gear assy	1.8.5
10	PQ43567A-7/M447	Guide arm assy	1.8.5
11	PU60617/M48	A/C head	1.8.3
12	PU60892/M422	Capstan motor	
13	PQ43558A/M442	Pinch roller arm assy	
14	PQ43676B/M434	MODE motor assy	
15	PQ32416-1-1/M446	Pinch roller cam	1.8.5
16	PQ32413/M438	Control cam	1.8.5
17	PQM30003-23/M437	Loading belt	
18	PU60621-1-1/M460	LED holder (D1)	
19	PU60858/M430	Reel disk (take-up)	
20	PU60618-1-2/M424	Idler gear assy	
21	PQM30003-24/M429	Belt	
22	PU60623/51PHS1	TU reel sensor	
23	PU60953-1-1/M426	Clutch UNIT	1.8.6
24	PQ43542B/M433	TU loading arm assy	1.8.7
25	PQ43537A/M432	SUP loading arm assy	1.8.7
26	PQ43555B/M439	Plate assy	1.8.7
27	PU60622-1-1/M462	Slide switch (S3)	
28	PU60629/56PHS3	Cassette sensor (PHS3)	
29	PN268VI-N[illegible]/56Q2	Start sensor (Q2)	
30	PUS29183B-6/M36	Cassette housing assy	
31	PU60859/M470	Reel disk (supply)	

- Symbol interpretation example

M3 2A OR 56 Q2
Ref. No.
Exploded view symbol
Ref. No.
Board No.

1.7 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage. Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced at regular intervals.

1.7.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary.

Also note that rubber parts may deform in time, even if the set is not used.

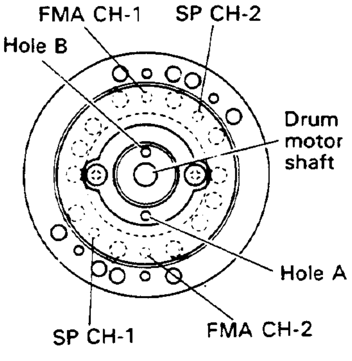
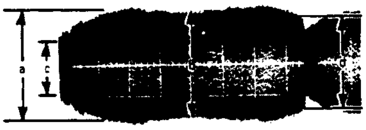
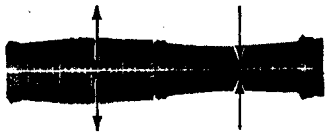
System	No.	Parts Name	Symbol No.	Periodic servicing schedule (operation hours)								
				250	500	750	1000	1250	1500	1750	2000	Overall
Tape Transport	1	Upper drum	M32A	★	★	☆	○	○	○	○	○	●
	11	A/C head	M48	★	★	★	○	○	○	○	○	●
	13	Pinch roller	M442	★	★	★	○	○	○	○	○	●
	2	Full erase head	M44	★	★	★	○	○	○	○	○	●
	4	Tension arm	M41									●
	6	Lower drum	M32C				○	○	○	○	○	●
	12	Capstan (shaft)	M422	★	★	★	★	★	★	★	★	●
	9	Half loading gear	M449									●
	10	Guide arm	M447									●
Drive	12	Capstan motor	M422				○	○	○	○	○	●
	17	Loading Belt	M437				○	○	○	○	○	●
	21	Reel Belt	M424				○	○	○	○	○	●
	19	Take-up reel disk	M430				○	○	○	○	○	●
	31	Supply reel disk	M470				○	○	○	○	○	●
	23	Clutch assy	M426								○	●
	14	MODE motor	M434				○	○	○	○	○	●
		Worm clutch assy	M436								△	●
		Plate assy	M439								△	●
Others	5	Tension band	M42				○				○	●
	8	Brush	M32D				○				○	●

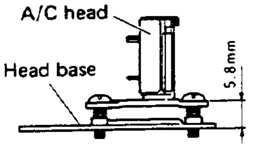
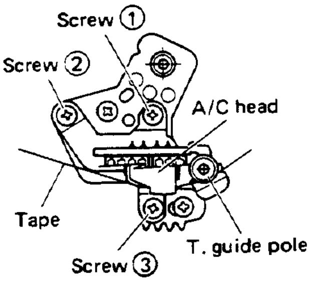
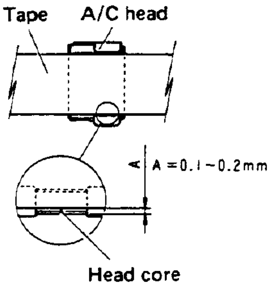
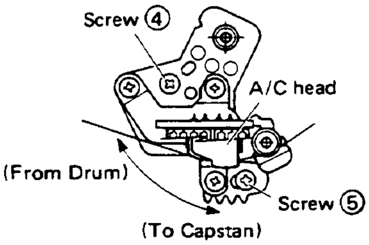
★ : Cleaning
☆ : Cleaning (or Replacement if necessary)
△ : Lubrication
No: Refer to Main mechanical parts

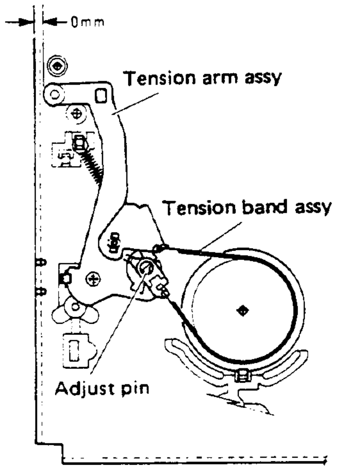
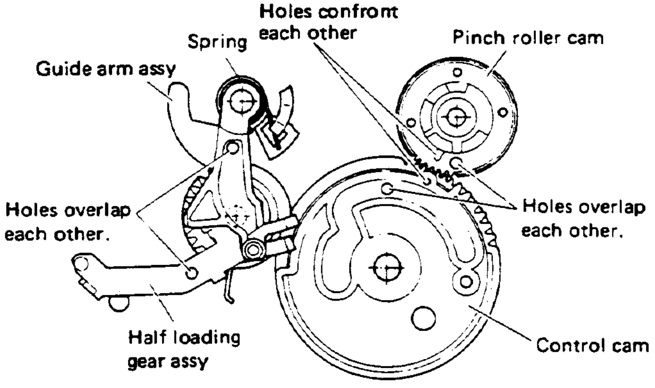
▲ : Lubrication (or Replacement if necessary)
● : Replacement
○ : Inspection or Replacement if necessary

Table 1-7-1 Approximately maintenance schedule

1.8 MAIN PARTS REMOVAL AND REPLACEMENT

No.	Item	Checkpoints	Adjustment and Checks
1	Upper drum assembly • Effects: FM signal absent, intermittent or weak on one channel; large difference in channel output levels • Cause: Worn or damaged video heads, poor response, etc.  FMA CH-1 SP CH-2 Hole B Drum motor shaft Hole A SP CH-1 FMA CH-2 Fig. 1-8-1  Fig. 1-8-3	Mounting direction See Fig. 1-8-1. (Effect: no picture)	After replacing, observe that upper drum hole is opposite the motor axis from lower drum hole B.
		Axis wobble See Fig. 1-8-2. (Effect: jitter, poor FM linearity) PB FM: Main board TP202 FF: Main board TP411	Record and play back in SP mode. Confirm absence of large difference between channels. (Fig. 1-8-2).  Fig. 1-8-2
		FM linearity check See Fig. 1-8-3. (Effect: vertical sync absent, picture noise) PB FM: Main board TP202 FF: Main board TP411 $\frac{b}{a} \geqq 0.75, \frac{c}{a} \geqq 0.65, \frac{d}{a} \geqq 0.65$	Set for Auto Tracking off by pressing the + and – buttons simultaneously. 1) Play stairstep signal of the MH-2 Alignment Tape. Confirm absence of obvious FM waveform loss and that operating the Tracking yields the optimum point. 2) Adjust for loss at the left edge (drum entry) of the FM waveform by turning the guide roller of the supply pole base. Similarly, adjust for loss at the right edge (drum exit) by turning the guide roller of the take-up pole base. **Note:** If FM loss occurs on both channels and cannot be corrected by adjusting the guide rollers, the lower drum needs replacement.
		Check switching point (Effect: switching noise at picture bottom)	See Electrical Adjustment (Servo circuit).
2	Lower drum assembly • Effects: Poor FM linearity, noisy rotation, jitter • Cause: Lead and bearing wear	Check FM linearity and switching point.	See above upper drum assembly items.
		Check control head phase (X value) Effect: tracking error PB FM: Main board TP202 FF: Main board TP411	1) Play stairstep signals of MH-2 and Alignment Tapes. Set for Auto Tracking off and Engage the Tracking Preset mode by pressing the + and – buttons simultaneously. Confirm that the same maximum FM waveform level is obtained as when the tracking is adjusted manually. 2) Refer to the A/C head adjustments. (1.8-3).

No.	Item	Checkpoints	Adjustment and Checks
3	A/C head	Temporarily set height as indicated in Fig. 1-8-4.	Set the height as indicated in Fig. 1-8-4 to facilitate tape transport checks and adjustments.
	 Fig. 1-8-4	Tilt (forward inclination) See Fig. 1-8-5. (Effect: audio level varies greatly.)	1) Run tape, turn screw ① counterclockwise to where slight curling of the tape occurs at the lower flange of the take-up guide roller. 2) Then slowly turn the screw clockwise to where the curling ceases.
	 Screw ① Screw ② A/C head Tape T. guide pole Screw ③ Fig. 1-8-5	Azimuth See Fig. 1-8-5 (Effect: audio low level or noisy) Audio output: Main board AUDIO OUT	1) Set front panel AUDIO MONITOR selector to Normal and play stairstep signal (with audio 6 kHz) of the MH-2 Alignment Tape. Observe audio output signal with oscilloscope. 2) Turn screw ② and adjust for maximum audio output level.
		Height See Figs. 1-8-5 and 1-8-6. (Effect: low audio and control signal levels)	1) Run tape and observe the control head area. 2) Turn screws ①, ② and ③ by small and equal amounts until 0.1 to 0.2 mm of the head core bottom can be seen. **Note:** If difficult to observe, play stairstep signal of MH-2 Alignment Tape and adjust for maximum audio output and control pulse level.
	 Fig. 1-8-6	FM linearity	Refer to upper drum assembly items. If adjustment is major, again check the azimuth.
		Control head phase See Fig. 1-8-7. PB FM: Main board TP202 FF : Main board TP411  Screw ④ A/C head (From Drum) Screw ⑤ (To Capstan) Fig. 1-8-7	1) Play stairstep signal of MH-2 Alignment Tape and observe the FM waveform. Set for Tracking Preset and Auto Tracking off by pressing the + and – buttons simultaneously. 2) Loosen screws ④ and ⑤. Set the A/C head positioning tool on screw ④, with the stud inserted into the nearby oblong hole. 3) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level. 4) Tighten screw ⑤ . Remove the tool and tighten screw ④. 5) If not maximum, slightly loosen screws ④ and ⑤. Use the tool and adjust the head position for the nearest maximum point. Then tighten screws ④ and ⑤.

No.	Item	Checkpoints	Adjustment and Checks
4	Tension arm assembly Tension band assembly  0mm Tension arm assy Tension band assy Adjust pin Fig. 1-8-8	Tension pole position See Fig. 1-8-8. (Effect: poor FM waveform response)	1) Remove the cassette housing assembly and set the mechanism for the playback mode (see 1.2). 2) Turn the eccentric adjust pin to align the tip of the tension arm with the edge of the main deck.
		Back tension (Effect: skew)	1) When the tension pole position is correctly adjusted, the back tension will assume the correct value. 2) Use the Back Tension Cassette Gauge and set for the playback mode. Confirm reading of 22 to 35. 3) Changing the tension pole position in order to vary the back tension will cause adverse effects elsewhere.
5	Pinch roller cam Control cam Half loading gear assembly Guide arm assembly		Set mechanism to Eject mode position.
	 Holes confront each other Spring Guide arm assy Pinch roller cam Holes overlap each other. Holes overlap each other. Half loading gear assy Control cam Fig. 1-8-9	Important: Do not remove or disturb parts other than those mentioned. See Fig. 1-8-9.	1) When installing the pinch roller cam, overlap the largest hole of the gear portion with the hole of the deck. 2) Set the control cam on the deck with the hole of the groove overlapped with the hole of the deck. Observe that the small hole of the control cam and the ridge of the pinch roller cam are aligned. (If the control cam does not fit readily, shift the rear plate assembly within the range of play.) 3) Install the half loading gear assembly with the hole overlapped with the hole of the deck. Secure with E-ring. 4) Install the guide assembly over the spring and with the hole overlapping that of the deck. Engage the spring correctly.
		Cassette housing assembly	Install the cassette housing assembly with the mechanism in the Eject mode. Also observe that the inner holder of the housing is raised and locked.

No.	Item	Checkpoints	Adjustment and Checks
6	Clutch assembly • Effect: inadequate take-up torque	Take-up torque	1) Remove cassette housing and set for playback mode (see 1.2). 2) Set torque gauge on the take-up reel disk. Gradually relax your grip on the gauge and read the needle indication at the point the gauge begins to rotate with the disk. Confirm indication of 60 to 100.
7	Take-up loading arm assembly Supply loading arm assembly Plate assembly		**Notes:** • Set mechanism to the Eject or Stop mode before removing these parts. • The flange of the plastic rivet securing the loading arm assembly and the pole base assembly can be damaged by attempting to remove it directly. Press the loading arm assembly firmly to prevent motion. Then use a narrow-shafted tool to press the rivet from the shaft end to remove it.
		Mounting position alignment • Remove the tension arm assembly to facilitate operation. See Fig. 1-8-10.	1) Set the supply and take-up loading arm assemblies so that the holes of the gear portions are aligned, then secure to the pole base assemblies with rivets. 2) Shift the plate assembly and install with the holes of the upper and lower components overlapped.
		Slide switch See Fig. 1-8-10.	Be sure to engage the slide switch slider with the edge of the plate assembly.

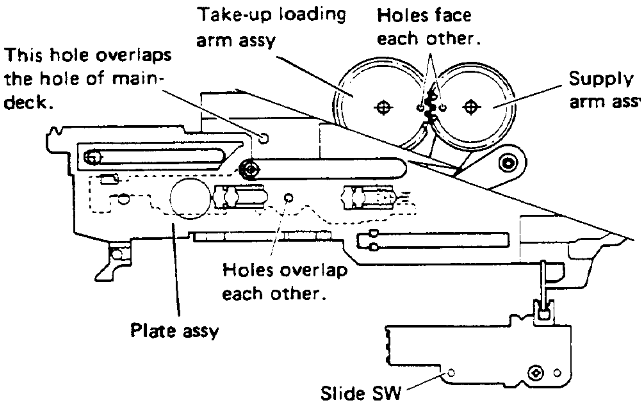

Take-up loading arm assy
Holes face each other.
This hole overlaps the hole of main-deck.
Supply loading arm assy
Holes overlap each other.
Plate assy
Slide SW

Fig. 1-8-10

SECTION 2
ELECTRICAL ADJUSTMENTS

2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

2.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: PAL color bar, stairstep, video sweeper
9. Signal generator: Audio multiplex TV signal generator
10. Recording tape
11. Alignment tape: MH-2, MH-F2
12. Presetting unit: PTU94008

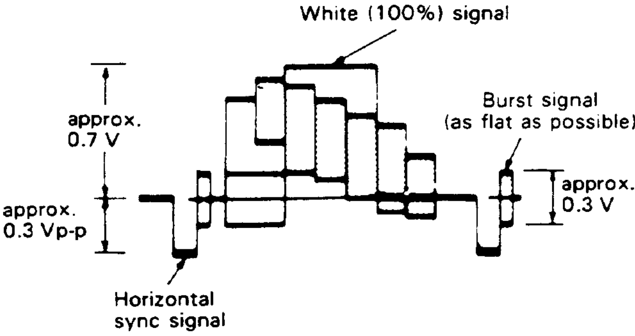

White (100%) signal
Burst signal
(as flat as possible)
approx.
0.7 V
approx.
0.3 V
approx.
0.3 Vp-p
Horizontal
sync signal

Fig. 2-1-1 Color bar signal of pattern generator

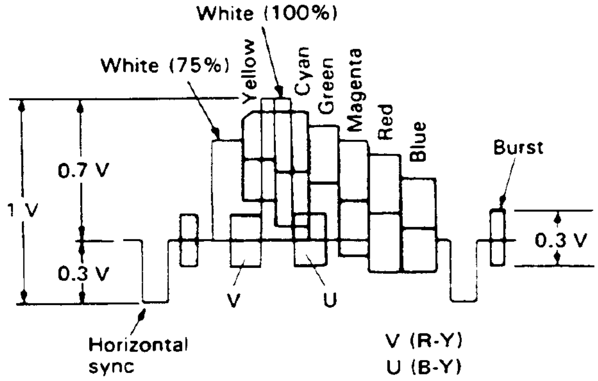

White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1 V
0.3 V
0.3 V
V
U
Horizontal
sync
V (R-Y)
U (B-Y)

Fig. 2-1-2 Color bar signal waveform

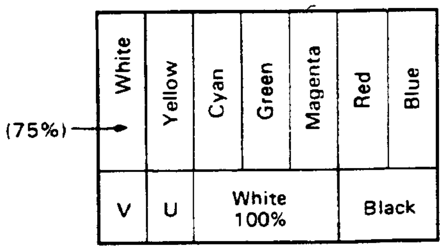

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
V
U
White
100%
Black

Fig. 2-1-3 Color bar pattern

2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

No.	Checks and adjustments are numbered in the recommended sequence in which they are to be performed.
Item	Name assigned to the particular check and adjustment step.
Check Point	Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.
Adjustment Parts	Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (—) indicates check only.
Signal & Mode	• Input signal required to perform adjustment. Dash (—) indicates that special signal is not required. • Equipment operating mode at time of check or adjustment.
Color bars	Color bars signal as video input.
Stairstep	Stairstep signal as video input.
1 kHz	1 kHz sinewave as audio input signal.
MH-2 color bars	Color bars segment of MH-2 alignment tape.
MH-2 stairstep	Stairstep segment of MH-2 alignment tape.
MH-2 1 kHz	1 kHz audio signal segment of MH-2 alignment tape.
MH-2 RF sweep	RF sweep segment of MH-2 alignment tape.
MH-F2 stairstep	Stairstep segment of MH-F2 alignment tape.
MH-F2 1 kHz	1 kHz FM audio signal segment of MH-F2 alignment tape.
E-E	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
SEARCH	Search (FWDS and REVS) playback mode
SLOW	Slow motion playback mode
STILL	Pause during playback mode
SP mode	SP recording speed
Description	This column provides an explanation of the step, notes and adjustment values.

2.2 REGULATOR CIRCUIT

Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	SWD 5V	TP802 TP803 (GND)	R807	•E-E •TUNER	1. Connect a digital voltmeter between TP802 and TP803 (GND). 2. Record in the TUNER mode, and adjust R807 for 5.3±0.1 V.

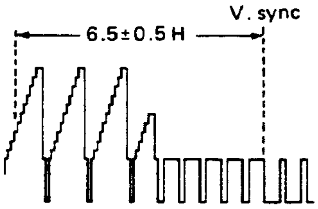
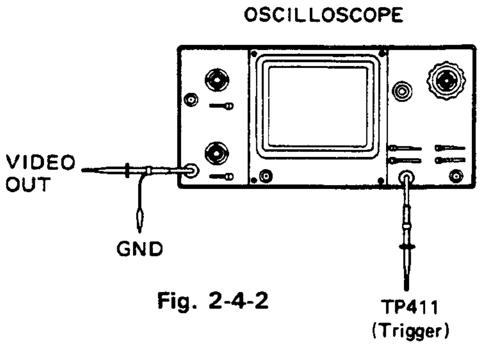
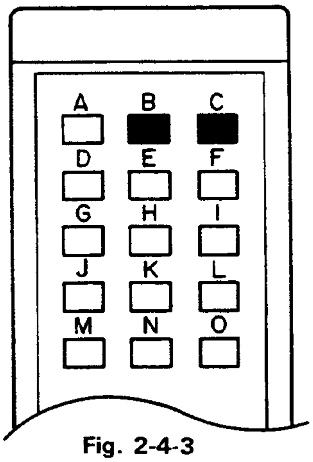
2.3 TIMER CIRCUIT

Note: Unless otherwise noted, all test points and adjustments are located on the TIMER board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Timer clock	IC1-16 TP1 (TEST)	C6	•E-E	1. Connect a frequency counter between IC1-16 and GND. 2. Short between TP1 (TEST) to GND, then short the leads of electrolytic capacitor C3 once in order to reset IC1. 3. Adjust C6 for 2048.000±0.002 Hz (488.2808 to 488.2818 μs).

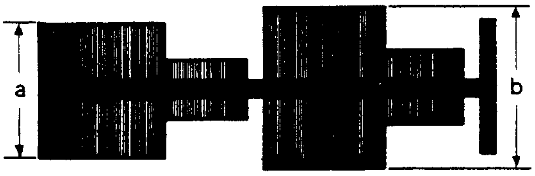
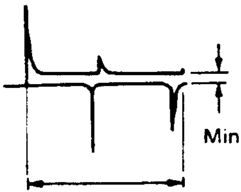
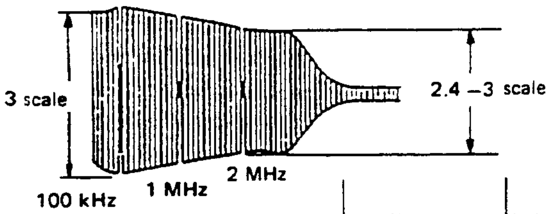
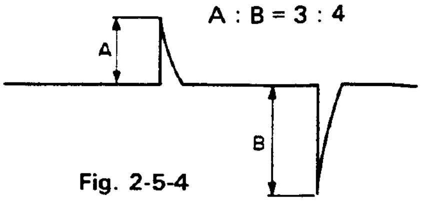
2.4 SERVO CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	SP PB switching point	VIDEO OUT	R420  Fig. 2-4-1	•PB •MH-2 (stairstep) •Trigger slope (–) •SP mode •AUTO TRACKING OFF	1. Connect an oscilloscope to VIDEO OUT. 2. Play back the stairstep segment of MH-2 alignment tape. 3. Trigger the oscilloscope externally (– slope) with the signal fròm TP411. 4. Adjust R420 to position the trigger point 6.5 ± 0.5H from V. sync.  Fig. 2-4-2
2	SP slow Tracking Pre-set	Monitor-TV  Fig. 2-4-3	Presetting Unit (PTU 94008)	•Slow PB •SP mode	**Note:** Set a VCR to A mode by remote controller. 1. Record a color bar signal in the SP mode, then play back the recorded color bar in the slow mode. 2. Set the tracking control of the FRONT panel to the center position by simultaneously pressing the ⊕ and – tracking buttons in the slow mode. 3. Observe the display on a monitor-TV and adjust for optimum noise conbition by presetting "B (–)" and "C (+)" buttons of the presetting unit (PTU94008), then press the stop button on the Front panel. 4. Confirm that bar noise is not visible in the picture.

2.5 VIDEO CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	SP REC Color Level and Balance	IC201-19 (VIDEO UNIT)  Fig. 2-5-1	R220	• PB mode • MH-2 color bar • REC then PB • Color bar • SP mode • AUTO TRACKING OFF	1. Connect an oscilloscope to IC201-19. Play back a color bar segment of the MH-2 and observe color signal level. 2. Adjust by pressing the + and – tracking buttons of the FRONT panel for maximum level of the color waveform and make a note of the higher color level. 3. Record and play back a color bar signal. If necessary, before recording, adjust R220 so that the higher level channel becomes 85 to 95% of the noted level during play back. At this time, confirm that the channel difference is within 3 dB.
2	Noise cancel balance	TP21 (VIDEO UNIT board)  Fig. 2-5-2	R16 (VIDEO UNIT board)	• Color bar • REC then PB	1. Record, then play back a color bar signal and connect an oscilloscope to TP21. 2. As indicated in the figure, adjust R16 for minimum DC step difference.
3	SP PB Frequency & CH Balance	VIDEO OUT  Fig. 2-5-3	R226	• REC then PB • Video sweep • SP mode • AUTO TRACKING OFF	1. Terminate VIDEO OUT at 75 Ω. Connect a video sweep generator to VIDEO IN. 2. Record and play back a video sweep signal in the SP mode. Use the control of the oscilloscope to position the 100 kHz region at graduation 3 (0 dB) of the oscilloscope scale. 3. Adjust R226 to position the 2 MHz of CH1 portion at 2.4 – 3.0 (–1 ± 1 dB) of the oscilloscope graduations as shown in Fig. 2-3-3. 4. Confirm that the channel difference is within 2 dB.
				• REC then PB • TV broadcast • SP mode	**Alternate method** 1. Record and play back a color broadcast that shows a good depiction of human facial contours in the SP mode. Adjust R226 to obtain distinct facial features on the monitor. **Note**: R226 nearly at the center position.
4	SECAM DET.	IC251-18 (VIDEO UNIT board)	LC251 (VIDEO UNIT board)	• E-E • SECAM color bar	1. Connect an oscilloscope to pin 18 of IC251. 2. Adjust LC251 so that A and B are related as follows: A : B = 3 : 4  Fig. 2-5-4

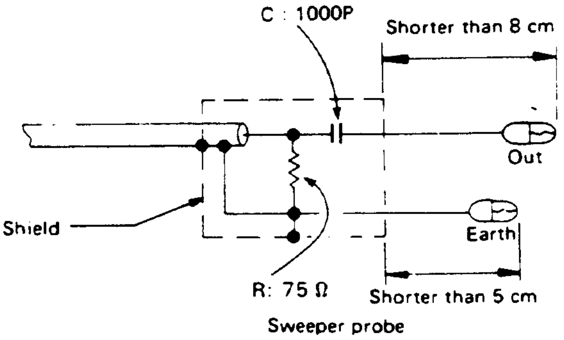
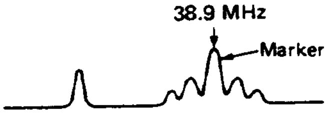
2.6 AUDIO CIRCUIT

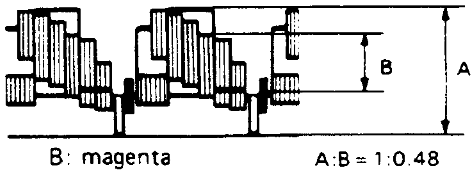
Note: Unless otherwise specified, all test points and adjustments are located on the AUDIO board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Audio Bias Level	TP31, TP32	R9	•SOURCE Select: AUX •SP mode	1. Connect a millivoltmeter between TP31 and TP32. 2. Set for REC mode without signal. 3. Adjust R9 for 1.9 mVrms.
2	E-E Level	AUDIO OUT	R40 (CH1/L)	•SOURCE Select: AUX •ALC: OFF •E-E (Stop) mode •AUDIO OUT to Hi-Fi	1. Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, −8 dBs audio signal to AUDIO IN and a VIDEO signal to VIDEO IN. 2. Set Hi-Fi REC level controls to center position. In the STOP (E-E) mode, adjust R40 to obtain −6±0.5 dBs at AUDIO OUT.
			R41 (CH2/R)		3. In the same manner, adjust R41 for the R (CH2) channel.
3	Level Indicator	FDP (Level Ind.)	R73 (Indicator CH1/L)	•AUX •AUDIO OUT to Hi-Fi •ALC: OFF •E-E (Stop) mode	**Note:** Perform the level indicator adjustment after completing the E-E level adjustment (section 2.6, No. 2). 1. Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, −8 dBs audio signal AUDIO IN. 2. Set Hi-Fi REC level controls to detent position. In the E-E (STOP) mode, adjust R73 to the point where the FDP level indicators show 0 dB (all white LEDs light).
			R74 (Indicator CH2/R)		3. In the same manner, adjust R74 for the R (CH2) channel.

2.7 TUNER/IF CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the TUNER/IF board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
	Equipment required: 1. Oscilloscope 2. IF sweep signal genrator with suitable markers (PIF, etc.) 3. Sweeper probe (sweep signal supply cable) as shown below.				 C : 1000P Shorter than 8 cm Out Shield Earth R: 75 Ω Shorter than 5 cm Sweeper probe Fig. 2-7-1
1	VCO  VCO and sweep signal (beat) Fig. 2-7-2	IC1-28	T2 (VCO)	• Sweep genrator out: 70 dBμ (38.9 MHz) • Tuner mode without antenna IN	1. Use a sweeper probe as shown in Fig. 2-6-1 and connect the sweep generator output to pin 1 of SAW 1. Adjust the sweep gain so that the waveform does not distort as observed with the oscilloscope. Connect the oscilloscope to pin 28 of IC1 (VIDEO DET OUT) and adjust T2 to align the waveform with the frequency marker as shown in Fig. 2-6-2.
				• TV broadcast • Tuner mode	**Alternate method:** 1. Receive a color broadcast on a VHF-HI channel (7 to 13). 2. Adjust T2 to obtain a fine picture on the monitor.
	• Before the following adjustments: 1. Connect a cable to ANT IN and terminate TV OUT at 75 Ω. 2. Set a TV channel signal generator as follows. Video : 65 dBμ/75 Ω, color bar 87.5% modulation Audio : 55 dBμ/75 Ω, 1 kHz ± 50 kHz deviation				
2	RF AGC	IF terminal of Front end	R21	• TV signal • Tuner mode	1. Connect the oscilloscope to IF terminal of U/V Tuner (Front end). Adjust R21 for maximum level, then again adjust R21 for –8 dB again.
		MONITOR	R21	• TV broadcast • Tuner mode	**Alternate method:** **Note:** Adjust R21 (RF AGC) to correct for excess noise in the picture or when streaky cross interference occurs due to strong electrical fields. 1. Adjust R21 to minimize noise or streaks on the TV screen. 2. Check for absence of abnormality on all channels.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
3	Color Level  Fig. 2-7-3	CN1-4 (VIDEO OUT)	R40	•TV signal •Tuner mode •Color bar	1. Receiving a color bar signal. Set the Y level for 100% reference signal and then adjust R40 for a magenta level of 48% at pin 4 of CN1.

2.8 DEMODULATOR CIRCUIT

Note: Unless otherwise noted, all test points and adjustments are located on the DEMODULATOR board.

Audio Multiplex TV Signal Generator

Recommanded Specifications

1. Signal Format	Based on CCIR-B
2. Frequency	
Video Carrier FV	38.9 MHz
1st Sound Carrier f_{s1}	33.4 MHz
2nd Sound Carrier f_{s2}	33.1578125 MHz
3. Modulator	
Video	Crosshatch (black on white) V: 50 Hz, H: 15.625 kHz
Audio	Sinewave 1 kHz; CH1 and CH-2 outputs switchable
4. Output	97 dB/μV (open)±2 dB fixed, BNC-R 75 Ω
5. P-S Ratio	S_1 P−13 dB±2 fixed S_2 P−20 dB±2 fixed
6. Modulation	
Video	87.5%±3%
Audio	±30 kHz±2 kHz
7. Stereo Separation	Less than −40 dB
8. Pilot Signal	
Carrier Frequency	54.6875 kHz±5 Hz synchronized type
Stereo	117.5 Hz AM 50%
Dual	274.1 Hz AM 50%

9. Sound Modulation Modes	S_1	S_2
Mono	Mono 1	Mono 2
Stereo	(L+R)/2	R
Dual	Mono 1	Mono 2
10. Functions	S_1	S_2
Mono (M)	100%	100%
Stereo (L, R)	(L+R)/2	R
(L)	L/2	—
(R)	R/2	R
(OFF)	—	—
Mult (S_1, S_2)	100%	100%
(S_1)	100%	0
(S_2)	0	100%
(OFF)	0	0
V. MOD (ON/OFF)		
11. Frequency Accuracy	Within±5×10^{-5}	
12. Spurious	Less than −50 dB	
13. Saw Filter	Self-contained	

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description

Equipment required:

1. Oscilloscope
2. Audio Multiplex TV Signal Generator
3. Sweeper probe (sweep signal supply cable) as shown below.

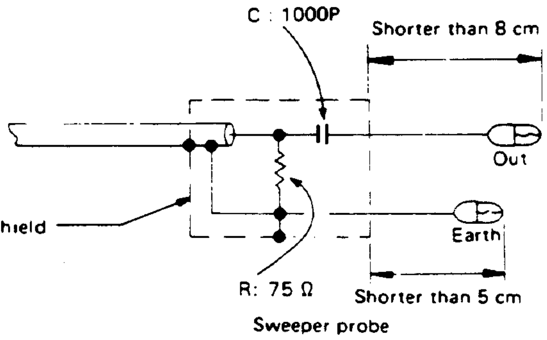
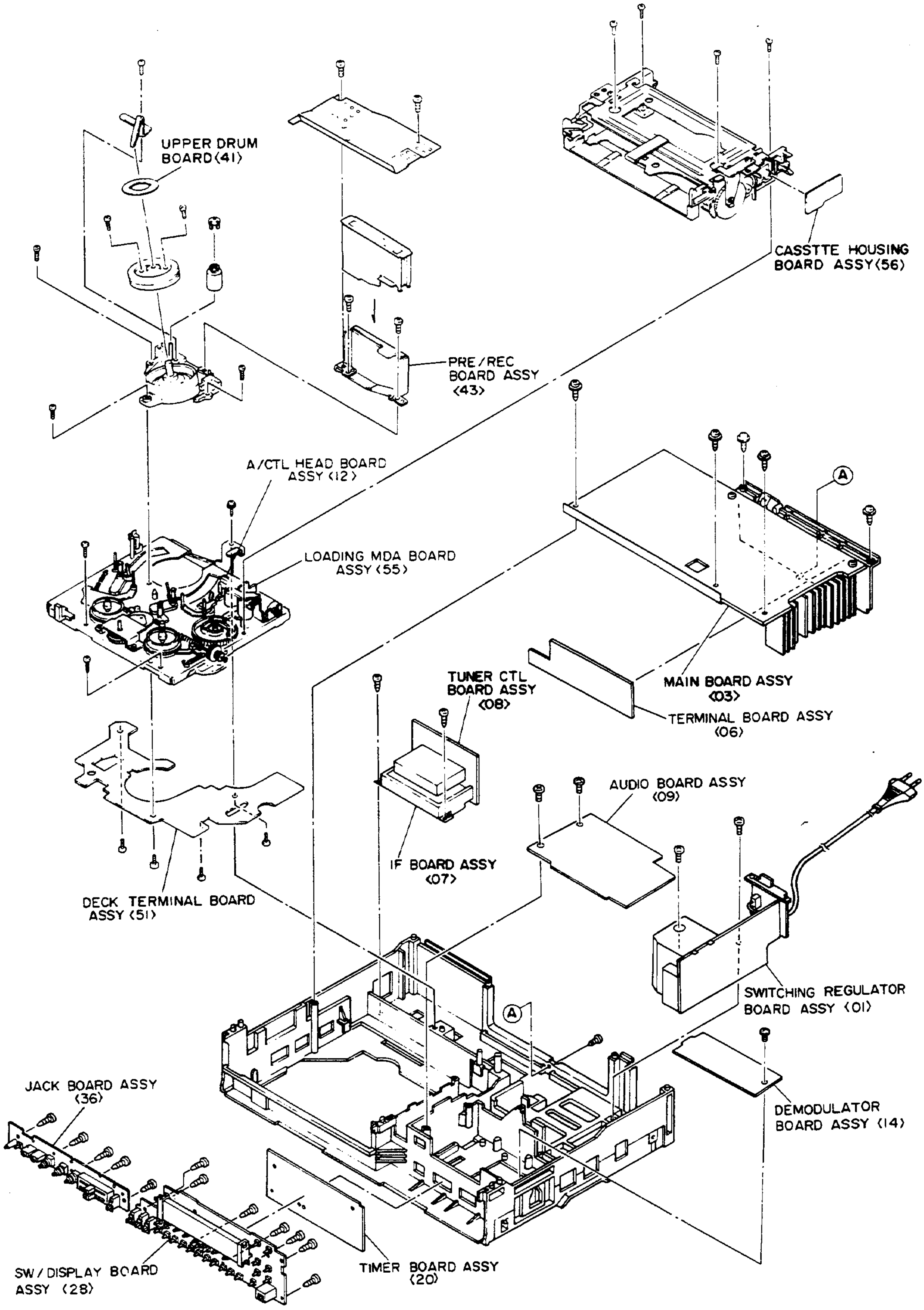


Fig. 2-8-1

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	First audio detector coil	IC1 Pin 3	T4 [IF PWB]	•BILING mode •SUB: unmod. •MAIN: mod.	1. Use a sweeper probe as shown in Fig. 2-8-1 and apply Main audio modulated signal to the front end IF terminal. 2. Connect a distortion meter to IC1 pin 3. 3. Adjust T4 of the IF board for minimum distortion. **Note:** Audio multiplex TV signal generator connection is the same for the following adjustments.
2	Second audio detector coil	IC1 pin 2	T1	•BILING mode •SUB: mod. •MAIN: unmod.	1. Connect a distortion meter to IC1 pin 2. 2. Adjust T1 for minimum distortion.
3	Stereo separation	IC1 pin 5	R2	•STEREO mode •R: mod. •L: unmod.	1. Set a signal generator to Stero mode, but adjust only the R channel. 2. Connect an oscilloscope to IC1 pin 5. 3. Adjust R2 for minimum output level.
4	Buzz	CN2 pin 2	T8, T2 [IF PWB]	•STEREO mode •R/L: unmod.	1. Connect a noise meter to CN2 pin 2 and an oscilloscope to AC output of the noise meter. 2. Adjust T8 of the IF board for minimum Philips pattern noise. 3. Adjust T2 of the IF board for minimum crosshatch noise.
5	Audio output level	CN2 pin 2(L) CN2 pin 4(R)	R21 (L) R24(R)	•STEREO mode •R: mod./unmod. •L: unmod./mod.	1. Set a signal generator for Stereo mode. 2. Connect a noise meter to CN2 pin 2. 3. Adjust R21 (L channel) for −14.0±0.5 dBs. 4. Similarly, connect a noise meter to pin 4 of CN2 and adjust R24 for the R channel.

SECTION 3
CHARTS AND DIAGRAMS

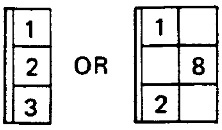
3.1 CIRCUIT BOARD AND LOCATION


UPPER DRUM BOARD<41>
PRE/REC BOARD ASSY <43>
CASSTTE HOUSING BOARD ASSY<56>
A/CTL HEAD BOARD ASSY <12>
LOADING MDA BOARD ASSY <55>
Ⓐ
MAIN BOARD ASSY <03>
TERMINAL BOARD ASSY <06>
TUNER CTL BOARD ASSY <08>
AUDIO BOARD ASSY <09>
IF BOARD ASSY <07>
DECK TERMINAL BOARD ASSY <51>
SWITCHING REGULATOR BOARD ASSY <01>
Ⓐ
DEMODULATOR BOARD ASSY <14>
JACK BOARD ASSY <36>
SW/DISPLAY BOARD ASSY <28>
TIMER BOARD ASSY <20>

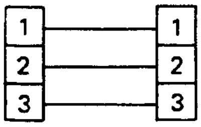
3.2 GENERAL INFORMATION

3.2.1 Connections

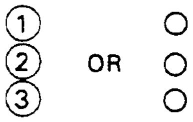
Note:
Unless otherwise specified, only signal input flow is indicated.
Connection arrows indicate only signal outputs.



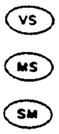
: Connectors



: Board in connectors



: Direct connections



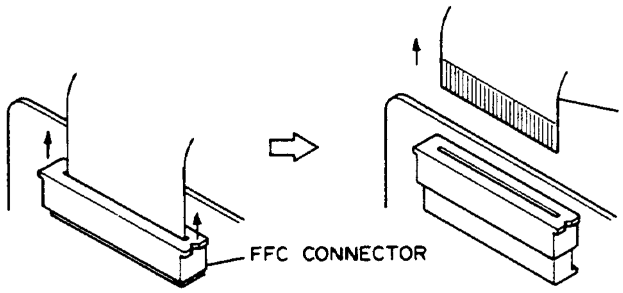
: Connected pattern in the board.
Abbreviations

V : Video	M : Mechacon
S : Servo	A : Audio

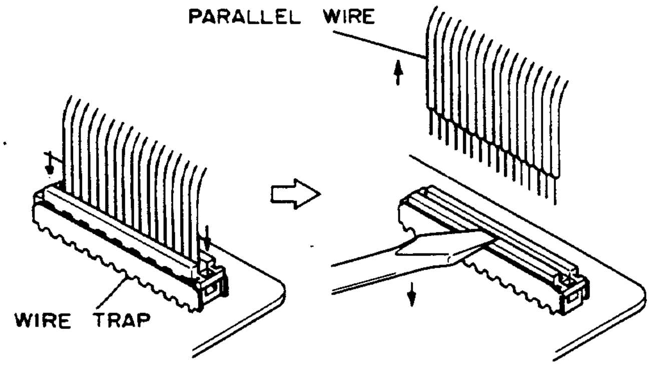
VS : Signal flow from video to servo.

3.2.2 Disconnecting the flatwire

1. Pull the connector structure upward to release the clamp when removing or inserting the flat wire cable.

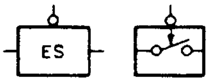


2. Depress the connector structure downward to release the clamp when removing or inserting the flat wire cable, as indicated below.

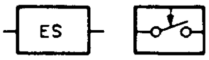


3.2.3 Indications

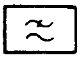
AUX : Active only at high.
$\overline{AUX}$: Active only at low.
$\bar{A}\bar{U}\bar{X}$: Active only at middle.
$\bar{A}U\bar{X}$: Active only at open.



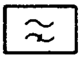
: Active only at low for electronic switch.



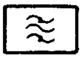
: Active only at high for electronic switch.



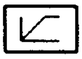
: Low pass filter.



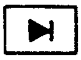
: High pass filter.



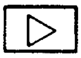
: Band pass filter.



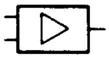
: Limiter.



: Detector



: Amplifier.



: Mixer stage.

3.2.4 Schematic diagram values

Unless otherwise specified.

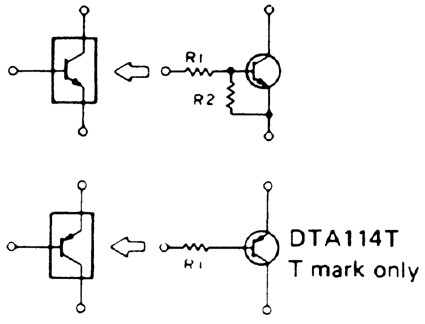
1. All resistance values are in ohms, 1/6 W, 1/8 W, (refer to parts list).
2. All capacitance values are in μF, (P; PF).
3. All inductance values are in μH, (m; mH).
4. All diodes are 1SS133 or MA165, (refer to parts list).
5. Voltages are DC-measured (reference to ground) with a digital voltmeter during recording (SP mode) and playback (SP mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parentheses.
6. Waveforms (VIDEO System) are measured (reference to ground) with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (reference to ground) with 1 kHz (−8 dBs) during recording and playback with alignment tape (1 kHz).
8. Shaded (   ) parts are critical for safety.
Replace only with specified parts numbers.

3.2.5 Signal flow in the schematic

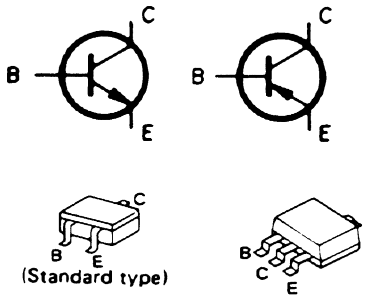
➡ Recording signal path
⇨ Playback signal path
▭▶ REC/PB signal path

3.2.6 Semiconductors

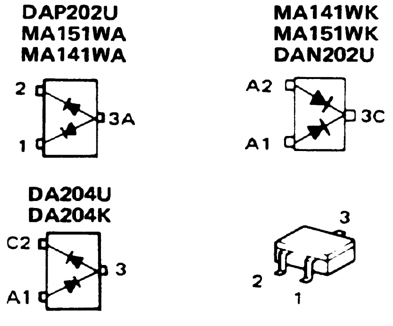
1. Digital transistor


R1
R2
R1
DTA114T
T mark only

2. Chip transistor


C
B
E
C
B
E
C
B
E
(Standard type)
B
C
E

3. Chip diode


DAP202U
MA151WA
MA141WA
2
1
3A
MA141WK
MA151WK
DAN202U
A2
A1
3C
DA204U
DA204K
C2
A1
3
3
2
1

Note:
The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

Uses:
Inverter, Interface, driver circuits.

3.2.7 Replacement of chip parts

For replacing chip parts, proceed it as follows.
Use a well insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temp.).
In addition, it is recommended to use a soldering iron (55 W approx.) with solder absorber for convenience.

Caution:
- Do not apply heat for more than 3 seconds.
- Do not rub electrodes.
- Do not reuse chips removed once. Discard them.
- Supplementary cementing is not required.

1. Soldered condition of chip parts

- Resistors, capacitors, etc.

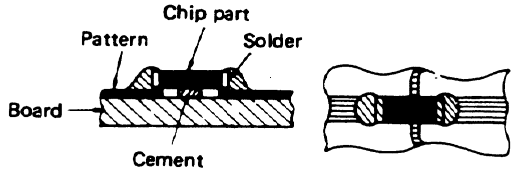

Chip part
Pattern
Solder
Board
Cement

Fig. 3-2-1 Soldering condition-1

- Transistors, diodes, etc.

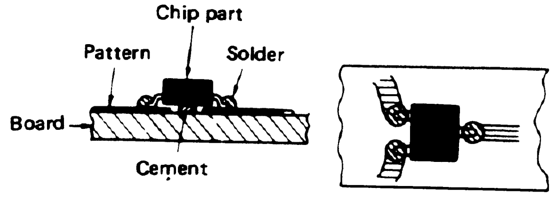

Chip part
Pattern
Solder
Board
Cement

Fig. 3-2-2 Soldering condition-2

2. How to remove chip parts

- Resistors, capacitors, etc.

1) Set a chip parts replacing tool onto the chip parts to hold it down.
2) Unsolder at a side of the chip parts.

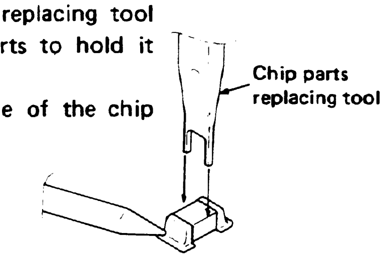

Chip parts replacing tool

Fig. 3-2-3 R/C removal-1

3) Remove the chip parts by twisting and sliding it.

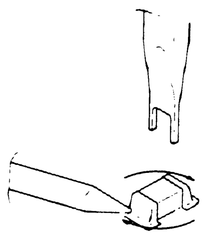


Fig. 3-2-4 R/C removal-2

3. How to remove transistors, diode.

1) Unsolder at the one-lead side of the chip parts.

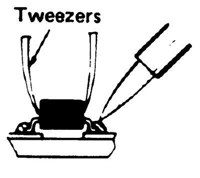


Fig. 3-2-5 Tr/Diode removal-1

2) Lift the unsoldered side upwards.

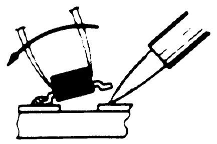


Fig. 3-2-6 Tr/Diode removal-2

3) Heat the other two leads simultaneously and remove the chip parts upwards.

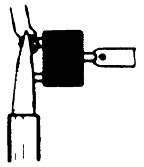


Fig. 3-2-7 Tr/Diode removal-3

4. Preheating and soldering

When setting new chip parts, especially capacitors, but except transistors, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes just before soldering. For soldering, use a soldering iron of 30 watt approximately.

5. How to set and solder chip parts

1) Presolder the contact points of the circuit pattern to which the chip parts will be soldered.

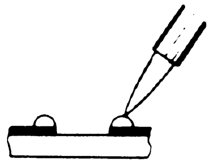


Fig. 3-2-8 Soldering-1

2) Holding down the chip parts with the chip parts replacing tool, solder it with a soldering iron.

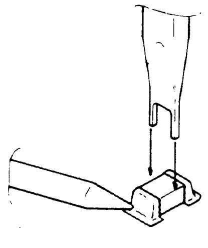


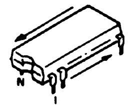
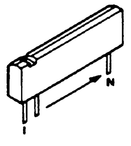
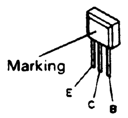
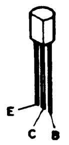
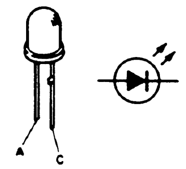
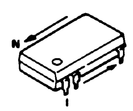
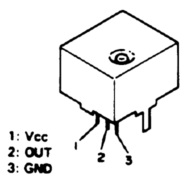
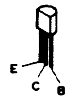
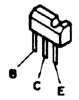
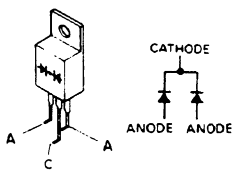
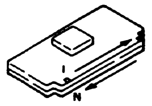
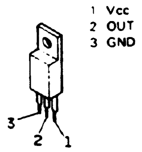
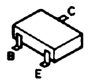
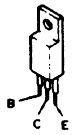
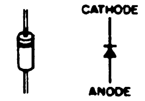
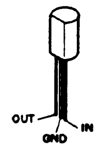
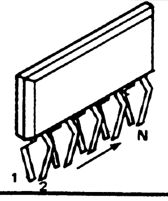
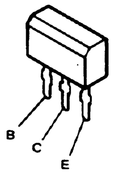
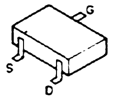
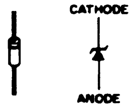
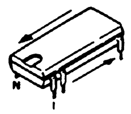
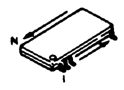
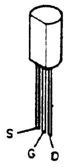
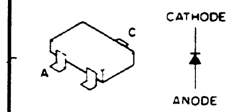
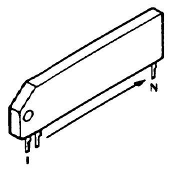
Fig. 3-2-9 Soldering-2

3.3 MAIN TYPES OF ACTIVE AND PACKAGE CIRCUITS

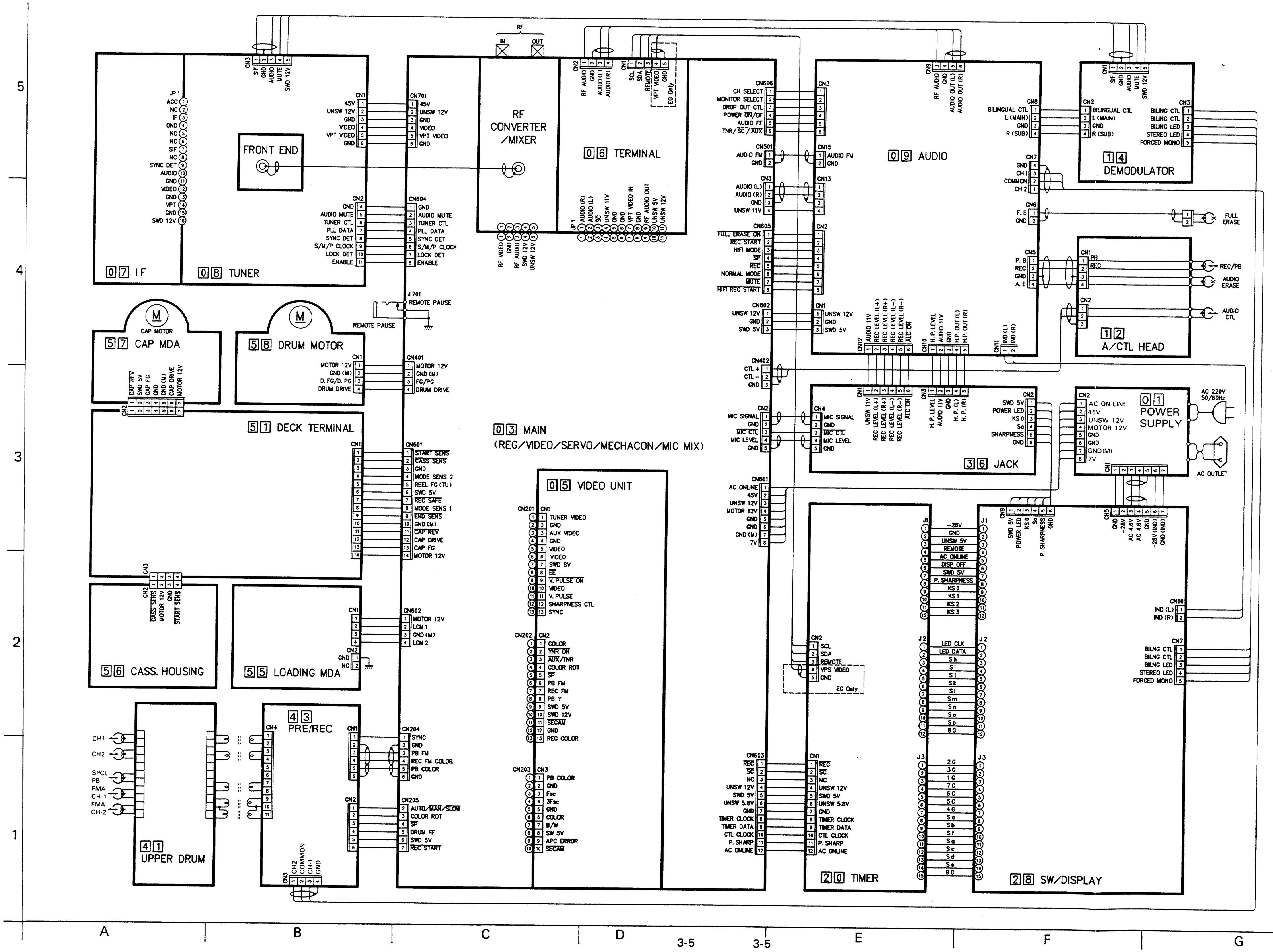
IC		
	NAME	L
A	AN3386NK	1A
	AN3880NK	1A
B	BA15218N	1B
	BA6418N	1B
	BA7106LS	4B
	BU4066B	1A
C	CAT35C104P-001	2A
	CAT35C104P-002	2A
G	GP1U521	2B
H	HD49733NT	2A
I	IC-PST523H-2	4A
L	LA7222	6A
M	M37418M6-185SP	1A
	M50253P	6A
	M51365SP	1A
	MC7805ACT	3B
	MSM6967RS	2A
	MSC1195SS	2A
P	PB20166G-01	3A
	PB20167A-01	3A
	PB20227A	3A
S	SDA5642	5A
T	TA7361AP	6A
	TDA3800GS	1A
U	UPD75216ACW-243	1A

TRANSISTOR		
	NAME	L
DTA	DTA114ES	1C
	DTA124ES	1C
	DTA144ES	1C
	DTA144EU	3C
DTB	DTB114ES	1C
DTC	DTC114ES	3C
	DTC124EK	3C
	DTC124ES	1C
	DTC143TS	1C
	DTC144EK	3C
	DTC144ES	1C
	DTC144WS	1C
	DTC144WU	3C
2SA	2SA1037K	3C
	2SA1267	1C
	2SA1576	3C
	2SA720	1D
	2SA854S	1D
	2SA933S	1C
2SB	2SB1068	1D
	2SB643S	2D
	2SB810	1C
2SC	2SC1317	2C
	2SC1740S	1C
	2SC2412K	3C
	2SC3199	1C
	2SC3354	2D
	2SC3616	
	2SC4081	3C
	2SC4517A	
2SD	2SD1292	1D
	2SD1450	1C
	2SD1468S	4D
	2SD1796	3D
	2SD1856	
	2SD1863	4C
2SK	2SK381	5C

DIODE		
	NAME	L
E	E-452-2	3E
F	FMB-24	2E
	FML-12S	2E
H	HZS3.9EB2TJ	4E
	HZS7.5EB2	4E
	HZT33-D2	4D
	HZ2BLL	4E
M	MA141K	5E
	MA165	3E
	MTZ13C	4E
	MTZ16BT-77	4E
	MTZ10D	4E
	MTZ30AT-77	4E
	MTZV6.2A	4E
O	OA90	3E
R	RD10ES-T1B2	4E
	RD5.6ES-T1B3	4E
	RD9.1EB3	4E
	RD9.1ESB2	4E
	RD9.1ES-T1B2	4E
S	SLH-34VC3F	1E
	SLH-34DC3F	1E
	SLR-34MC3F	1E
	SLR-34VC3F	1E
1	1SS132	3E
	1SS133	3E
	10E6-F2	3E
	11ES2	3E
	AG01	3E
	AU01	3E
	AU01Z	3E

	Integrated Circuit		**Transistor**		**Diode**
	A	**B**	**C**	**D**	**E**
1			 Marking E C B		
2		 1: Vcc 2: OUT 3: GND 1 2 3			 CATHODE ANODE ANODE A A C
3		 1 Vcc 2 OUT 3 GND 3 2 1			 CATHODE ANODE
4					 CATHODE ANODE
5					 C A CATHODE ANODE
6					

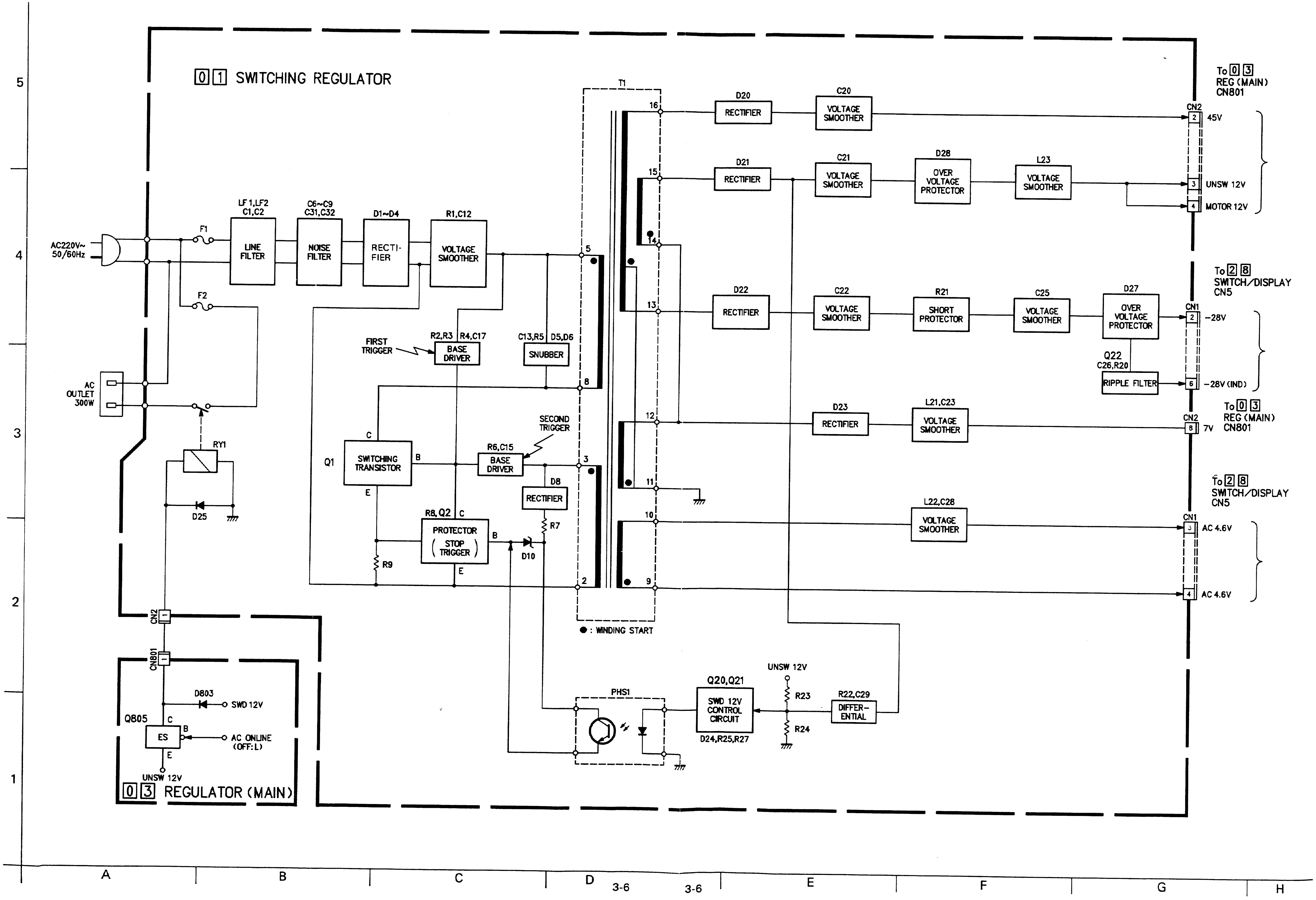
3.4 BOARD INTERCONNECTIONS



07 IF
08 TUNER
FRONT END
RF CONVERTER /MIXER
06 TERMINAL
09 AUDIO
14 DEMODULATOR
57 CAP MDA
CAP MOTOR
58 DRUM MOTOR
REMOTE PAUSE
12 A/CTL HEAD
01 POWER SUPPLY
AC 220V 50/60Hz
AC OUTLET
51 DECK TERMINAL
03 MAIN (REG/VIDEO/SERVO/MECHACON/MIC MIX)
36 JACK
05 VIDEO UNIT
56 CASS. HOUSING
55 LOADING MDA
41 UPPER DRUM
43 PRE/REC
20 TIMER
28 SW/DISPLAY
FULL ERASE
REC/PB
AUDIO ERASE
AUDIO CTL
EG Only
A
B
C
D
E
F
G
H
1
2
3
4
5

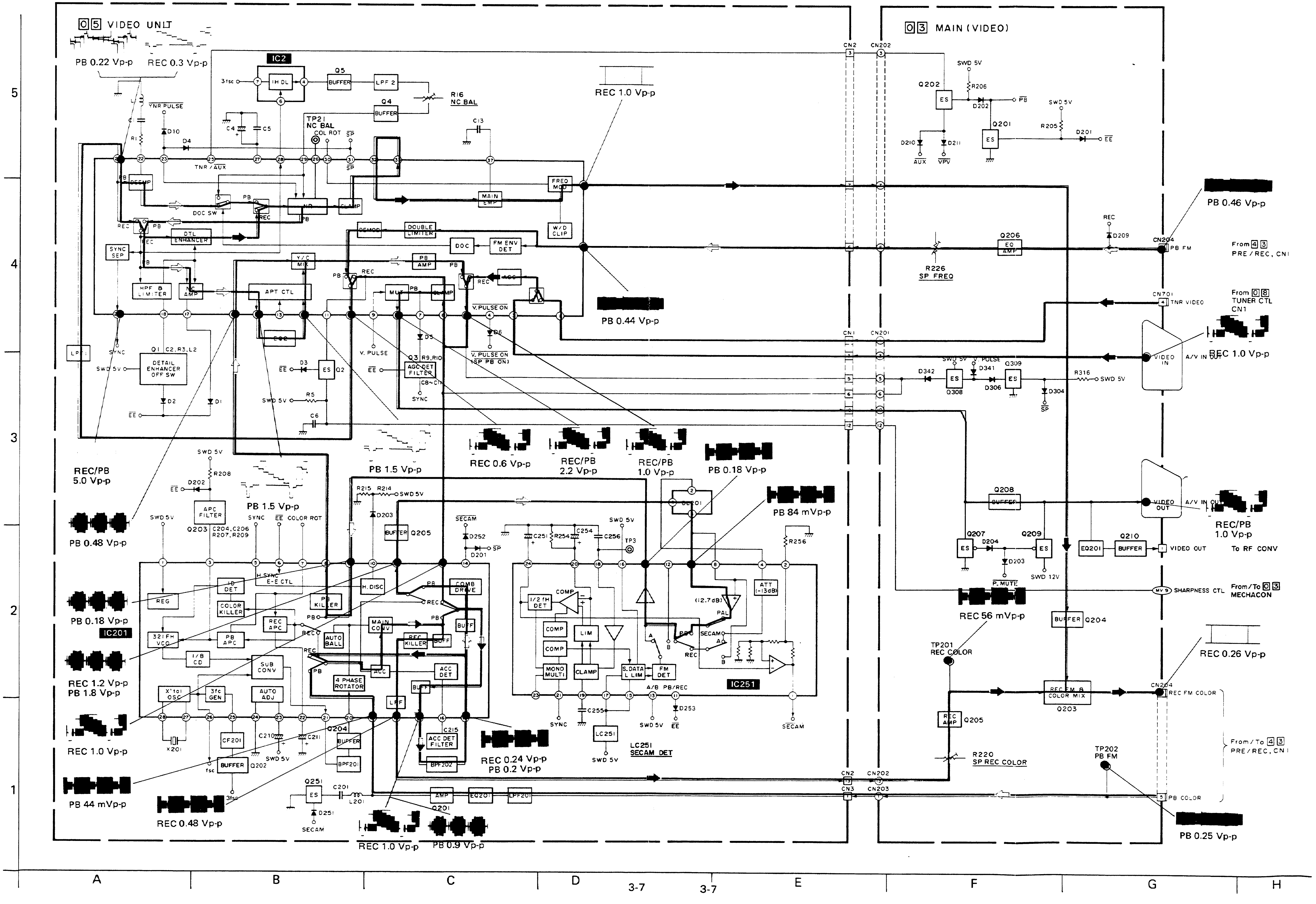
NO	NAME
58	DRUM MOTOR
57	CAP MDA
56	CASS HOUSING
55	LOADING MDA
54	
53	
52	
51	DECK TERMINAL
50	
43	PRE/REC
41	UPPER DRUM
36	JACK
28	SW/DISPLAY
22	OPERATION
21	
20	TIMER
19	
18	
17	
16	
15	
14	DEMODULATOR
13	
12	A/CTL HEAD
11	
10	
09	AUDIO
08	TUNER CTL
07	IF
06	TERMINAL
05	VIDEO UNIT
04	
03	MAIN
02	
01	POWER SUPPLY

3.5 POWER SUPPLY BLOCK DIAGRAM

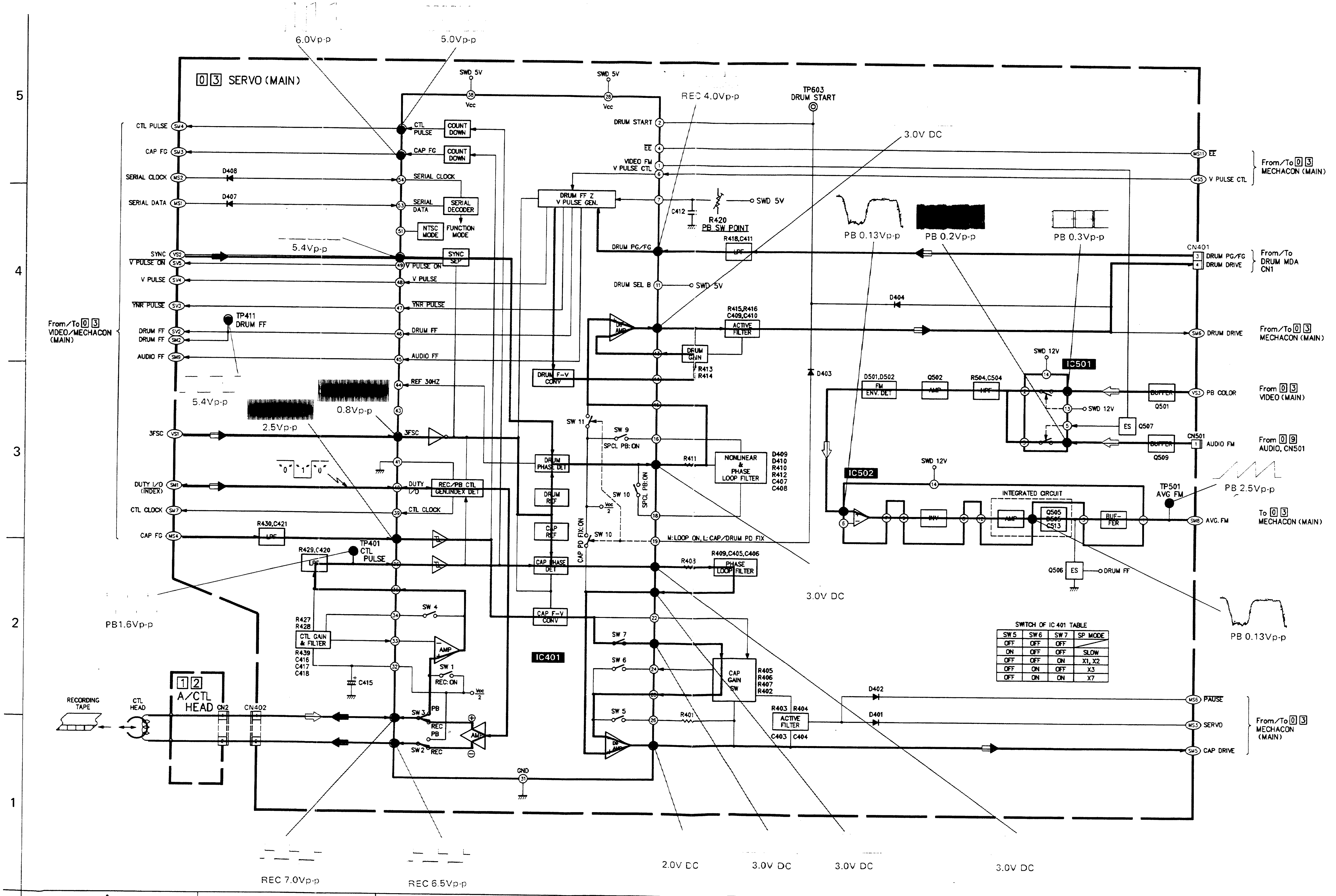


01 SWITCHING REGULATOR
AC220V~ 50/60Hz
F1
F2
LF1,LF2 C1,C2
LINE FILTER
C6~C9 C31,C32
NOISE FILTER
D1~D4
RECTI-FIER
R1,C12
VOLTAGE SMOOTHER
AC OUTLET 300W
RY1
D25
FIRST TRIGGER
R2,R3
R4,C17
BASE DRIVER
C13,R5
D5,D6
SNUBBER
Q1
C
B
E
SWITCHING TRANSISTOR
SECOND TRIGGER
R6,C15
BASE DRIVER
D8
RECTIFIER
R7
R8,Q2
PROTECTOR (STOP TRIGGER)
D10
R9
T1
● : WINDING START
D20
RECTIFIER
C20
VOLTAGE SMOOTHER
D21
RECTIFIER
C21
VOLTAGE SMOOTHER
D28
OVER VOLTAGE PROTECTOR
L23
VOLTAGE SMOOTHER
D22
RECTIFIER
C22
VOLTAGE SMOOTHER
R21
SHORT PROTECTOR
C25
VOLTAGE SMOOTHER
D27
OVER VOLTAGE PROTECTOR
Q22
C26,R20
RIPPLE FILTER
D23
RECTIFIER
L21,C23
VOLTAGE SMOOTHER
L22,C28
VOLTAGE SMOOTHER
To 03 REG (MAIN) CN801
CN2
45V
UNSW 12V
MOTOR 12V
To 28 SWITCH/DISPLAY CN5
CN1
-28V
-28V (IND)
To 03 REG (MAIN) CN801
CN2
7V
To 28 SWITCH/DISPLAY CN5
CN1
AC 4.6V
AC 4.6V
PHS1
Q20,Q21
SWD 12V CONTROL CIRCUIT
D24,R25,R27
UNSW 12V
R23
R24
R22,C29
DIFFER-ENTIAL
CN2
CN801
D803
SWD 12V
Q805
ES
AC ONLINE (OFF:L)
UNSW 12V
03 REGULATOR (MAIN)
1
2
3
4
5
A
B
C
D
E
F
G
H

3.6 VIDEO BLOCK DIAGRAM


05 VIDEO UNIT
PB 0.22 Vp-p
REC 0.3 Vp-p
IC2
1H DL
3fsc
Q5
BUFFER
LPF 2
Q4
BUFFER
R16
NC BAL
TP21
NC BAL
COL ROT
SP
C4
C5
C13
YNR PULSE
D10
D4
R1
L1
C1
TNR / AUX
DEEMP
DOC SW
NR
CLAMP
MAIN EMP
FREQ MOD
W/D CLIP
REC 1.0 Vp-p
PB 0.44 Vp-p
DTL ENHANCER
SYNC SEP
DEMOD
DOUBLE LIMITER
DOC
FM ENV DET
Y/C MIX
PB AMP
AGC
HPF & LIMITER
NC AMP
APT CTL
MUL
CLAMP
CCC
V. PULSE ON
V. PULSE ON (SP PB ON)
D5
D6
Q1 C2,R3,L2
DETAIL ENHANCER OFF SW
SWD 5V
D2
D1
EE
LPF1
SYNC
D3
ES
Q2
R5
C6
V. PULSE
Q3 R9,R10
AGC DET FILTER
C8~C11
REC/PB 5.0 Vp-p
PB 0.48 Vp-p
PB 1.5 Vp-p
REC 0.6 Vp-p
REC/PB 2.2 Vp-p
REC/PB 1.0 Vp-p
PB 0.18 Vp-p
PB 84 mVp-p
R208
D202
APC FILTER
Q203 C204,C206 R207,R209
R215
R214
D203
BUFFER Q205
SECAM
D252
D201
SP
C251
R254
C254
C256
TP3
DL201
R256
H SYNC
E-E CTL
REG
1D DET
COLOR KILLER
REC APC
PB APC
321FH VCO
1/8 CD
SUB CONV
X'tal OSC
3fc GEN
AUTO ADJ
PB KILLER
H. DISC
MAIN CONV
AUTO BALL
REC KILLER
BUFF
COMB DRIVE
ACC
ACC DET
4 PHASE ROTATOR
LPF
IC201
PB 0.18 Vp-p
REC 1.2 Vp-p
PB 1.8 Vp-p
REC 1.0 Vp-p
PB 44 mVp-p
REC 0.48 Vp-p
X201
CF201
C210
C211
BUFFER
Q202
fsc
Q204
BUFFER
BPF201
C215
ACC DET FILTER
BPF202
REC 0.24 Vp-p
PB 0.2 Vp-p
1/2 fH DET
COMP
LIM
MONO MULTI
CLAMP
S.DATA L LIM
FM DET
(12.7dB)
PAL
SECAM
ATT (-13dB)
A/B PB/REC
IC251
D253
C255
LC251
LC251 SECAM DET
Q251
C201
L201
D251
AMP
EQ201
LPF201
Q201
REC 1.0 Vp-p
PB 0.9 Vp-p
CN2
CN202
CN1
CN201
CN3
CN203
03 MAIN (VIDEO)
Q202
ES
R206
D202
PB
D210
D211
AUX
VPV
Q201
R205
D201
EE
PB 0.46 Vp-p
D209
CN204
PB FM
From 43 PRE/REC, CN1
Q206
EQ AMP
R226
SP FREQ
CN701
TNR VIDEO
From 08 TUNER CTL CN1
VIDEO IN
A/V IN OUT
REC 1.0 Vp-p
D342
Q308
D341
Q309
D306
R316
D304
Q208
BUFFER
VIDEO OUT
REC/PB 1.0 Vp-p
Q207
D204
Q209
EQ201
Q210
VIDEO OUT
To RF CONV
D203
P. MUTE
SWD 12V
SHARPNESS CTL
From/To 03 MECHACON
REC 56 mVp-p
BUFFER Q204
REC 0.26 Vp-p
TP201 REC COLOR
REC FM & COLOR MIX
Q203
REC AMP
Q205
R220
SP REC COLOR
TP202 PB FM
REC FM COLOR
PB COLOR
From / To 43 PRE/REC, CN1
PB 0.25 Vp-p
1
2
3
4
5
A
B
C
D
E
F
G
H

3.7 SERVO BLOCK DIAGRAM

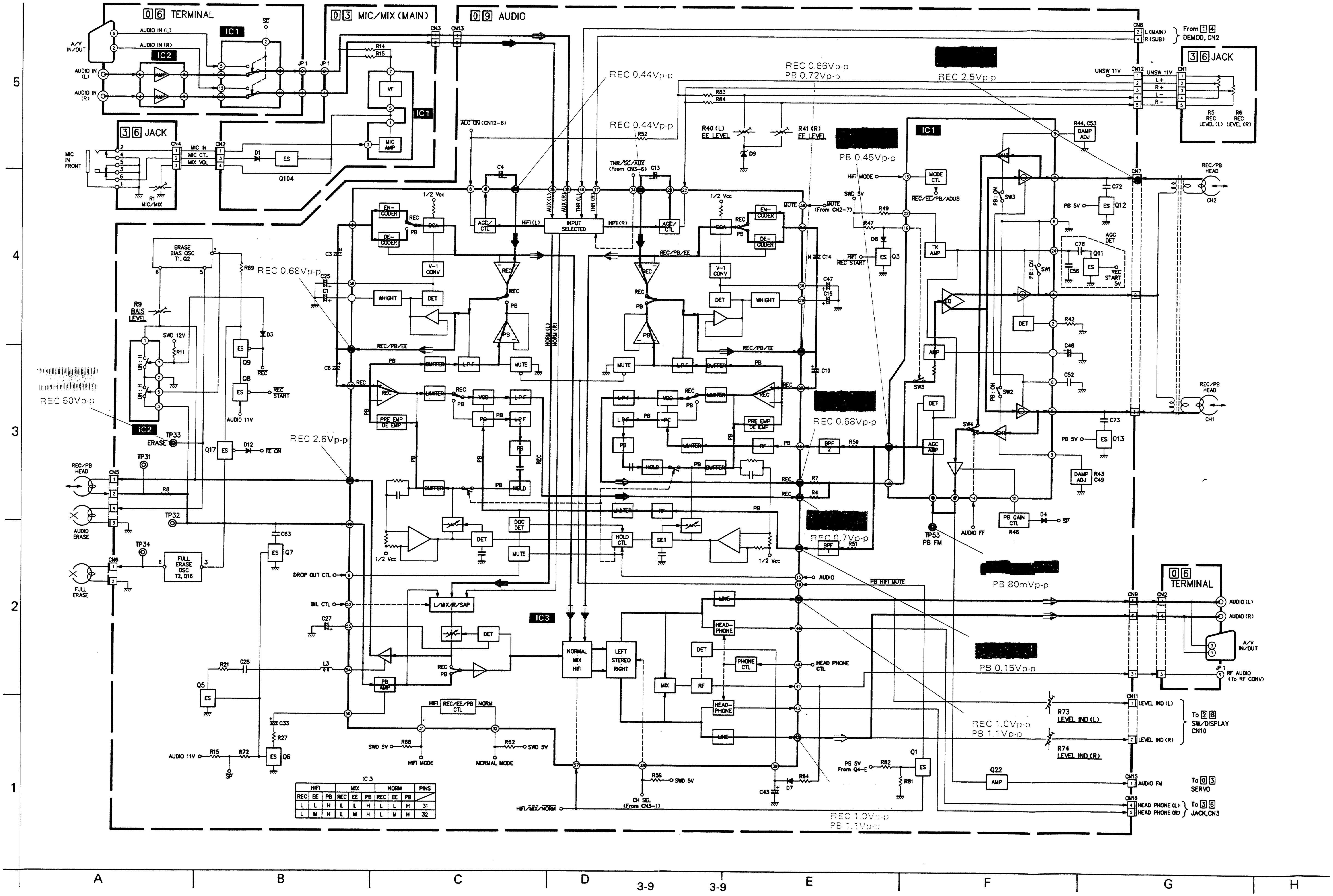


03 SERVO (MAIN)
6.0Vp-p
5.0Vp-p
SWD 5V
Vcc
DRUM START
EE
VIDEO FM
V PULSE CTL
REC 4.0Vp-p
TP603
DRUM START
3.0V DC
CTL PULSE
CAP FG
SERIAL CLOCK
SERIAL DATA
D408
D407
COUNT DOWN
SERIAL DECODER
NTSC MODE
FUNCTION MODE
SYNC SEP
DRUM FF Z V PULSE GEN.
C412
R420 PB SW POINT
PB 0.13Vp-p
PB 0.2Vp-p
PB 0.3Vp-p
SYNC
V PULSE ON
V PULSE
YNR PULSE
DRUM FF
AUDIO FF
REF 30HZ
5.4Vp-p
DRUM PG/FG
R418,C411
LPF
CN401
DRUM PG/FG
DRUM DRIVE
From/To DRUM MDA CN1
From/To 03 MECHACON (MAIN)
From/To 03 VIDEO/MECHACON (MAIN)
TP411 DRUM FF
DRUM SEL B
D404
R415,R416 C409,C410
ACTIVE FILTER
DIF AMP
DRUM GAIN
R413 R414
DRUM F-V CONV
D403
D501,D502 FM ENV. DET
Q502 AMP
R504,C504 HPF
SWD 12V
IC501
BUFFER
Q501
Q507
ES
Q509
PB COLOR
From 03 VIDEO (MAIN)
CN501
AUDIO FM
From 09 AUDIO, CN501
0.8Vp-p
2.5Vp-p
3FSC
SW 11
SW 9
SPCL PB: ON
R411
NONLINEAR & PHASE LOOP FILTER
D409 D410 R410 R412 C407 C408
IC502
INTEGRATED CIRCUIT
INV
AMP
Q505 B505 C513
BUF-FER
TP501 AVG FM
PB 2.5Vp-p
AVG. FM
To 03 MECHACON (MAIN)
DUTY I/O (INDEX)
REC/PB CTL GEN.INDEX DET
DRUM PHASE DET
DRUM REF
SW 10
CAP PD FIX: ON
CTL CLOCK
CAP REF
M: LOOP ON, L: CAP/DRUM PD FIX
R430,C421
TP401 CTL PULSE
R429,C420
CAP PHASE DET
R403
R409,C405,C406
PHASE LOOP FILTER
Q506
DRUM FF
3.0V DC
PB1.6Vp-p
R427 R428
CTL GAIN & FILTER
R439 C416 C417 C418
SW 4
AMP
CAP F-V CONV
SW 7
SW 6
CAP GAIN SW
R405 R406 R407 R402
IC401
C415
SW 1
REC: ON
Vcc/2
PB 0.13Vp-p
RECORDING TAPE
CTL HEAD
12 A/CTL HEAD
CN2
CN402
SW 3
PB
REC
SW 2
D402
D401
PAUSE
SERVO
CAP DRIVE
SW 5
R401
R403 R404
ACTIVE FILTER
C403 C404
GND
REC 7.0Vp-p
REC 6.5Vp-p
2.0V DC
3.0V DC
3.0V DC
3.0V DC
A
B
C
D
E
F
G
H
1
2
3
4
5

SWITCH OF IC 401 TABLE

SW 5	SW 6	SW 7	SP MODE
OFF	OFF	OFF	
ON	OFF	OFF	SLOW
OFF	OFF	ON	X1, X2
OFF	ON	OFF	X3
OFF	ON	ON	X7

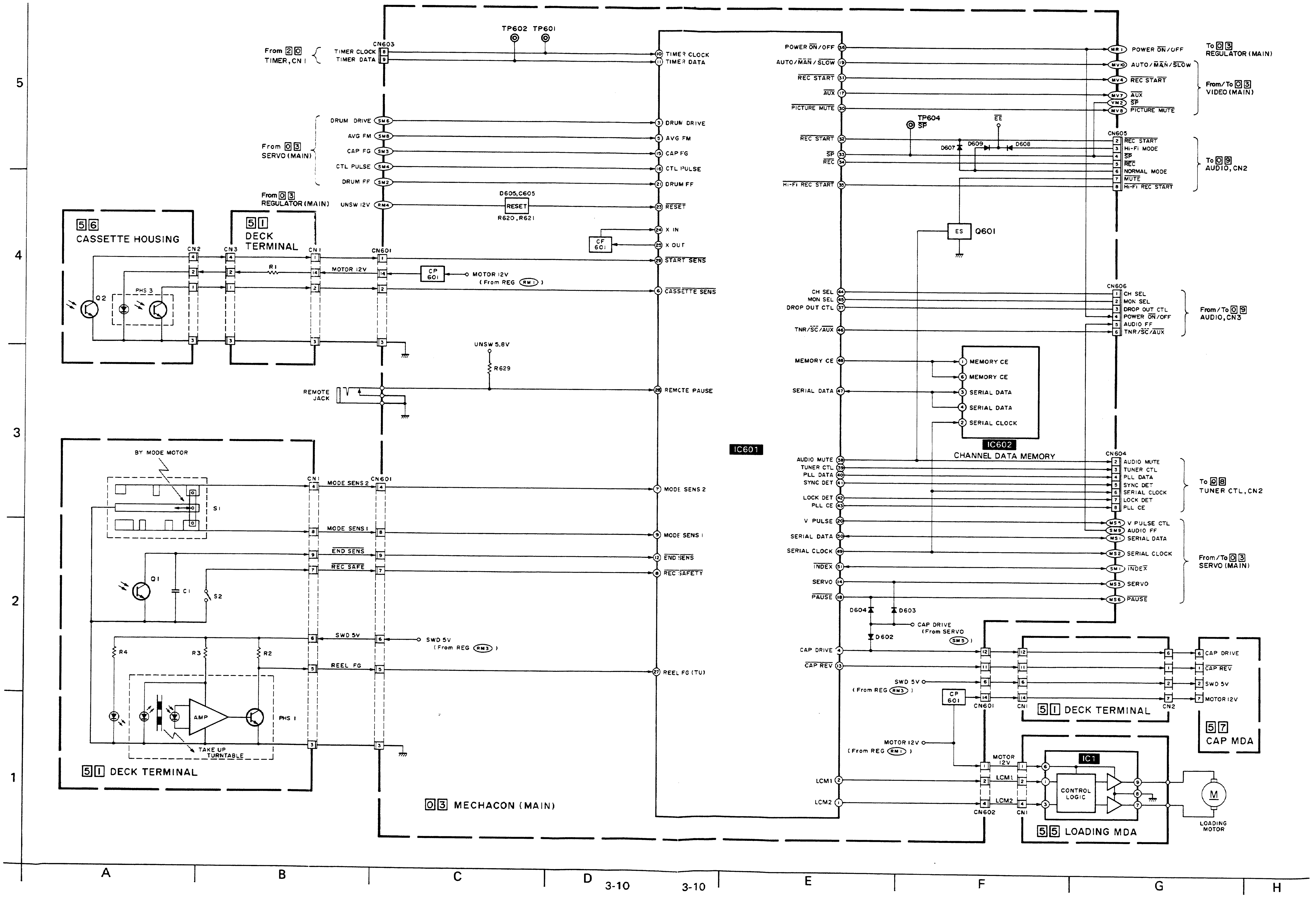
3.8 AUDIO BLOCK DIAGRAM


06 TERMINAL
03 MIC/MIX (MAIN)
09 AUDIO
36 JACK
IC1
IC2
IC3
A/V IN/OUT
AUDIO IN (L)
AUDIO IN (R)
AMP
VF
MIC AMP
MIC IN FRONT
MIC IN
MIC CTL
MIX VOL
R1 MIC/MIX
ES
Q104
ALC ON (CN12-6)
REC 0.44Vp-p
REC 0.44Vp-p
REC 0.66Vp-p
PB 0.72Vp-p
[redacted]
REC 2.5Vp-p
R40 (L) EE LEVEL
R41 (R) EE LEVEL
[redacted]
PB 0.45Vp-p
HIFI MODE
MODE CTL
REC/EE/PB/ADUB
From 14 DEMOD, CN2
L (MAIN)
R (SUB)
UNSW 11V
36 JACK
R5 REC LEVEL (L)
R6 REC LEVEL (R)
R44, C53 DAMP ADJ
REC/PB HEAD
CH2
CH1
TNR/SC/AUX (From CN3-6)
1/2 Vcc
EN-CODER
DE-CODER
OCA
AGC/CTL
INPUT SELECTED
HIFI (L)
HIFI (R)
AUX (L)
AUX (R)
TNR (L)
TNR (R)
V-1 CONV
WHIGHT
DET
REC/PB/EE
MUTE (From CN2-7)
HIFI REC START
TK AMP
AGC DET
REC START 5V
ERASE BIAS OSC T1, Q2
R9 BAIS LEVEL
SWD 12V
REC 0.68Vp-p
REC 50Vp-p
REC START
AUDIO 11V
TP33 ERASE
FE ON
REC 2.6Vp-p
REC/PB HEAD
AUDIO ERASE
FULL ERASE
FULL ERASE OSC T2, Q16
TP31
TP32
TP34
BUFFER
LPF
MUTE
LIMITER
VCO
PRE EMP DE EMP
HOLD
DOC DET
HOLD CTL
NORM (L)
NORM (R)
[redacted]
REC 0.68Vp-p
BPF 2
BPF 1
[redacted]
REC 0.7Vp-p
ACC AMP
TP53 PB FM
PB GAIN CTL R48
AUDIO FF
DAMP ADJ R43 C49
[redacted]
PB 80mVp-p
DROP OUT CTL
BIL CTL
L/MIX/R/SAP
PB AMP
NORMAL MIX HIFI
LEFT STEREO RIGHT
HEAD-PHONE
LINE
PHONE CTL
HEAD PHONE CTL
MIX
RF
PB HIFI MUTE
AUDIO
06 TERMINAL
AUDIO (L)
AUDIO (R)
RF AUDIO (To RF CONV)
[redacted]
PB 0.15Vp-p
REC 1.0Vp-p
PB 1.1Vp-p
R73 LEVEL IND (L)
R74 LEVEL IND (R)
To 28 SW/DISPLAY CN10
Q22 AMP
AUDIO FM
To 03 SERVO
HEAD PHONE (L)
HEAD PHONE (R)
To 36 JACK,CN3
HIFI REC/EE/PB NORM CTL
HIFI MODE
NORMAL MODE
SWD 5V
CH SEL (From CN3-1)
HIFI/MIX/NORM
PB 5V From Q4-E
REC 1.0Vp-p
PB 1.1Vp-p
AUDIO 11V
A
B
C
D
E
F
G
H
1
2
3
4
5

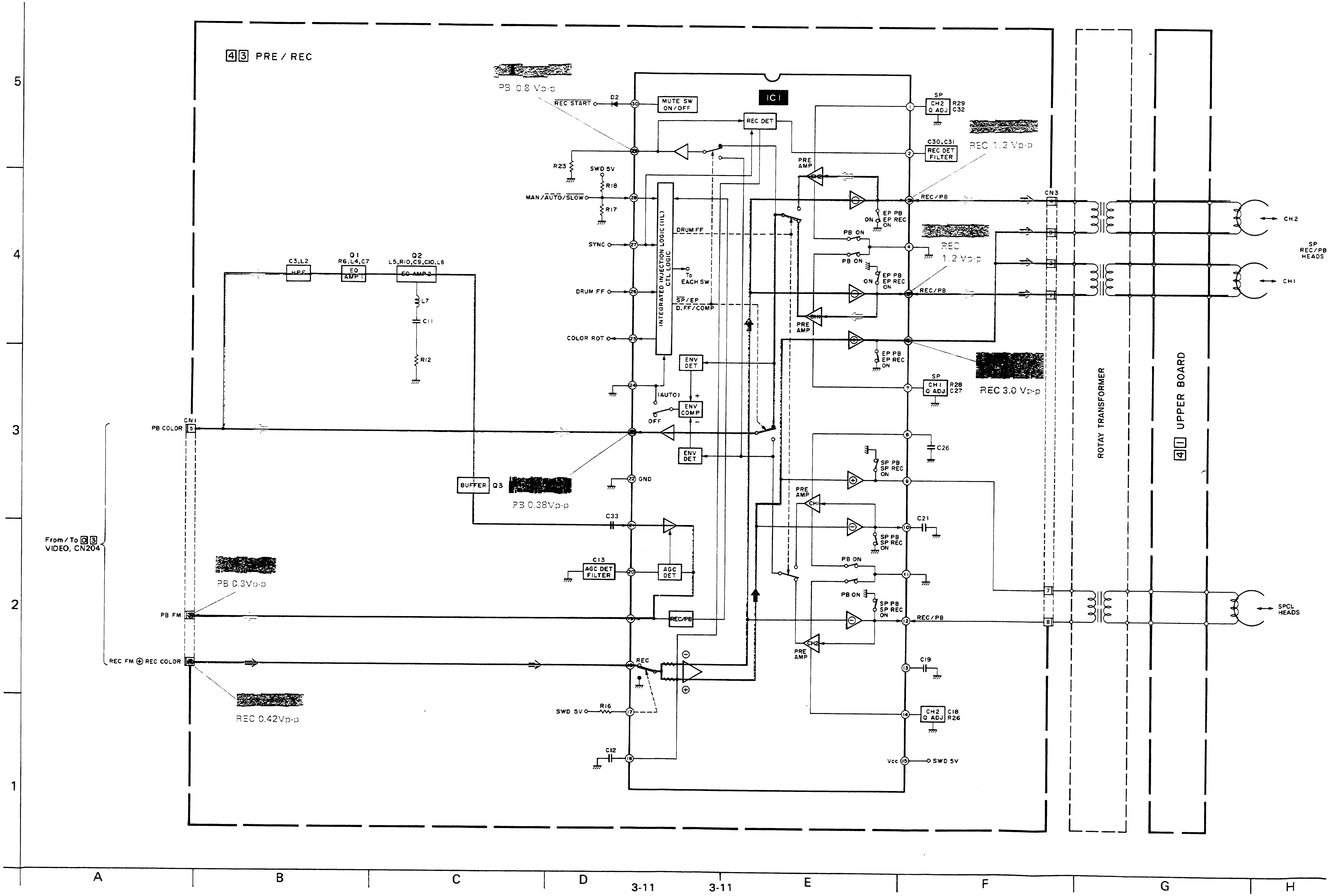
IC 3

HIFI			MIX			NORM			PINS
REC	EE	PB	REC	EE	PB	REC	EE	PB	
L	L	H	L	L	H	L	L	H	31
L	M	H	L	M	H	L	M	H	32

3.9 SYSTEM CONTROL BLOCK DIAGRAM

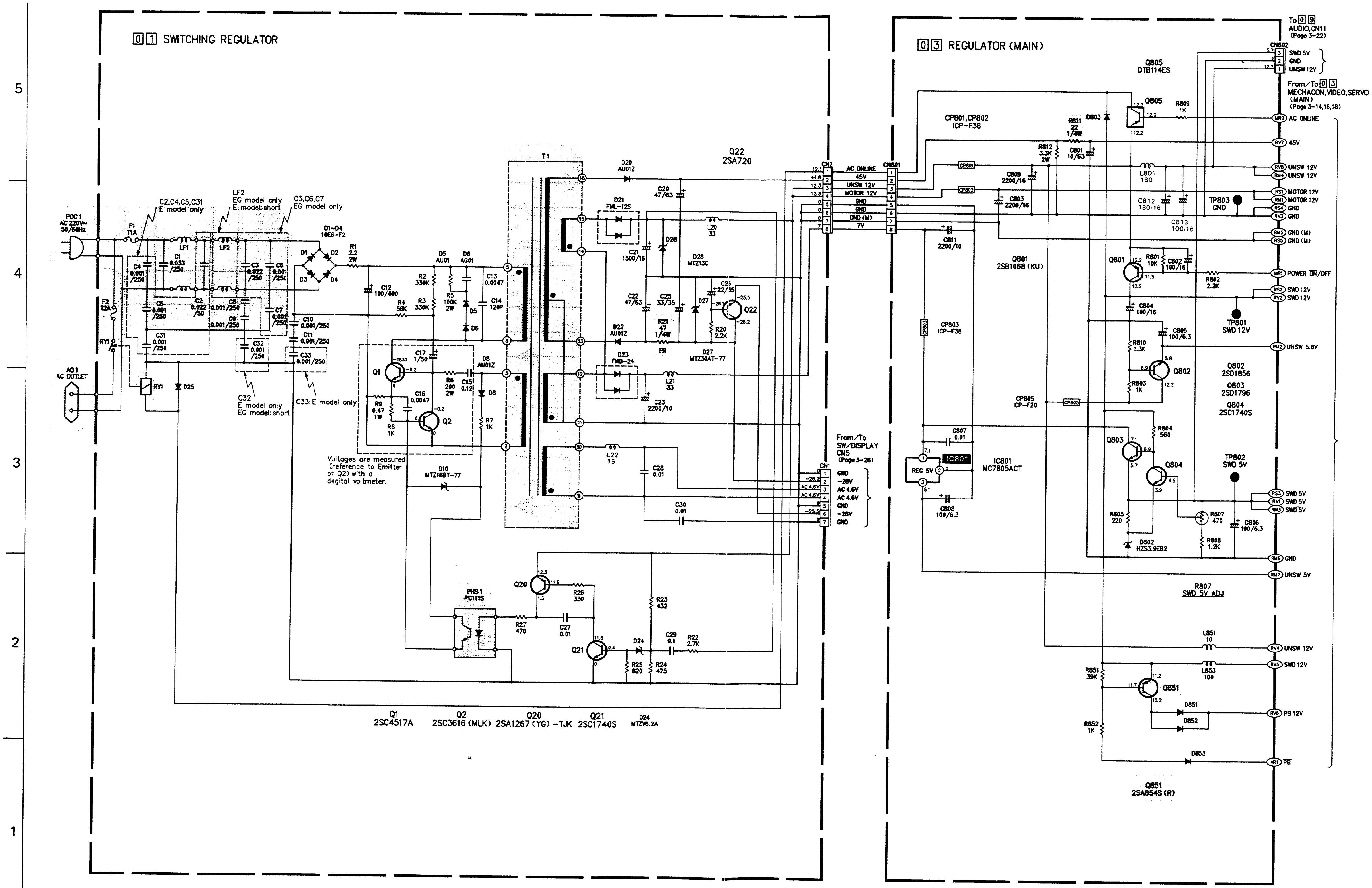

TP602 TP601
CN603
From 2 0 TIMER, CN1
TIMER CLOCK 8
TIMER DATA 9
TIMER CLOCK
TIMER DATA
DRUM DRIVE SM6
AVG FM SM8
CAP FG SM3
CTL PULSE SM4
DRUM FF SM2
From 0 3 SERVO (MAIN)
From 0 3 REGULATOR (MAIN)
UNSW 12V RM4
D605, C605
RESET
R620, R621
DRUM DRIVE
AVG FM
CAP FG
CTL PULSE
DRUM FF
RESET
X IN
X OUT
CF 601
START SENS
CASSETTE SENS
5 6 CASSETTE HOUSING
CN2
Q2
PHS 3
5 1 DECK TERMINAL
CN3
R1
CN1
CN601
MOTOR 12V
CP 601
MOTOR 12V (From REG RM1)
UNSW 5.8V
R629
REMOTE JACK
REMOTE PAUSE
BY MODE MOTOR
S1
MODE SENS 2
MODE SENS 1
END SENS
REC SAFE
Q1
C1
S2
REC SAFETY
SWD 5V
SWD 5V (From REG RM3)
R4
R3
R2
REEL FG
REEL FG (TU)
AMP
PHS 1
TAKE UP TURNTABLE
5 1 DECK TERMINAL
0 3 MECHACON (MAIN)
IC601
POWER ON/OFF
AUTO/MAN/SLOW
REC START
AUX
PICTURE MUTE
TP604 SP
EE
D607
D609
D608
HI-FI REC START
SP
REC
ES
Q601
MR1 POWER ON/OFF
To 0 3 REGULATOR (MAIN)
MV10 AUTO/MAN/SLOW
MV4 REC START
MV7 AUX
VM2 SP
MV8 PICTURE MUTE
From/To 0 3 VIDEO (MAIN)
CN605
REC START
Hi-Fi MODE
SP
REC
NORMAL MODE
MUTE
Hi-Fi REC START
To 0 9 AUDIO, CN2
CH SEL
MON SEL
DROP OUT CTL
TNR/SC/AUX
CN606
CH SEL
MON SEL
DROP OUT CTL
POWER ON/OFF
AUDIO FF
TNR/SC/AUX
From/To 0 9 AUDIO, CN3
MEMORY CE
SERIAL DATA
MEMORY CE
MEMORY CE
SERIAL DATA
SERIAL DATA
SERIAL CLOCK
IC602
CHANNEL DATA MEMORY
AUDIO MUTE
TUNER CTL
PLL DATA
SYNC DET
LOCK DET
PLL CE
CN604
AUDIO MUTE
TUNER CTL
PLL DATA
SYNC DET
SERIAL CLOCK
LOCK DET
PLL CE
To 0 8 TUNER CTL, CN2
V PULSE
SERIAL DATA
SERIAL CLOCK
INDEX
SERVO
PAUSE
MS5 V PULSE CTL
SM9 AUDIO FF
MS1 SERIAL DATA
MS2 SERIAL CLOCK
SM1 INDEX
MS3 SERVO
MS6 PAUSE
From/To 0 3 SERVO (MAIN)
D604
D603
D602
CAP DRIVE (From SERVO SM5)
CAP DRIVE
CAP REV
SWD 5V (From REG RM3)
CP 601
CN601
CN1
5 1 DECK TERMINAL
CN2
CAP DRIVE
CAP REV
SWD 5V
MOTOR 12V
5 7 CAP MDA
MOTOR 12V (From REG RM1)
MOTOR 12V
LCM1
LCM2
CN602
CN1
IC1
CONTROL LOGIC
M
LOADING MOTOR
5 5 LOADING MDA
A
B
C
D
E
F
G
H
1
2
3
4
5

3.10 PRE/REC BLOCK DIAGRAM



43 PRE / REC
IC1
PB 0.8 Vp-p
REC START
D2
MUTE SW ON/OFF
REC DET
R23
SWD 5V
R18
R17
MAN/AUTO/SLOW
SYNC
DRUM FF
COLOR ROT
INTEGRATED INJECTION LOGIC (IIL) CTL LOGIC
DRUM FF
To EACH SW
SP/EP D.FF/COMP
ENV DET
ENV COMP
(AUTO)
OFF
GND
C3, L2 HPF
Q1 R6, L4, C7 EQ AMP 1
Q2 L5, R10, C9, C10, L6 EQ AMP 2
L7
C11
R12
CN1
PB COLOR
BUFFER Q3
PB 0.38Vp-p
C33
AGC DET
C13 AGC DET FILTER
REC/PB
PB 0.3Vp-p
PB FM
From/To 03 VIDEO, CN204
REC FM ⊕ REC COLOR
REC 0.42Vp-p
REC
SWD 5V
R16
C12
SP CH2 Q ADJ R29 C32
C30, C31 REC DET FILTER
REC 1.2 Vp-p
PRE AMP
CH2
REC/PB
EP PB EP REC ON
PB ON
REC 1.2 Vp-p
CH1
REC 3.0 Vp-p
SP CH1 Q ADJ R28 C27
C26
SP PB SP REC ON
C21
C19
CH2 Q ADJ C18 R26
Vcc
SWD 5V
CN3
ROTAY TRANSFORMER
41 UPPER BOARD
CH2
CH1
SP REC/PB HEADS
SPCL HEADS
1 2 3 4 5
A B C D E F G H

3.11 SWITCHING REGULATOR AND REGULATOR (MAIN) SCHEMATIC DIAGRAMS

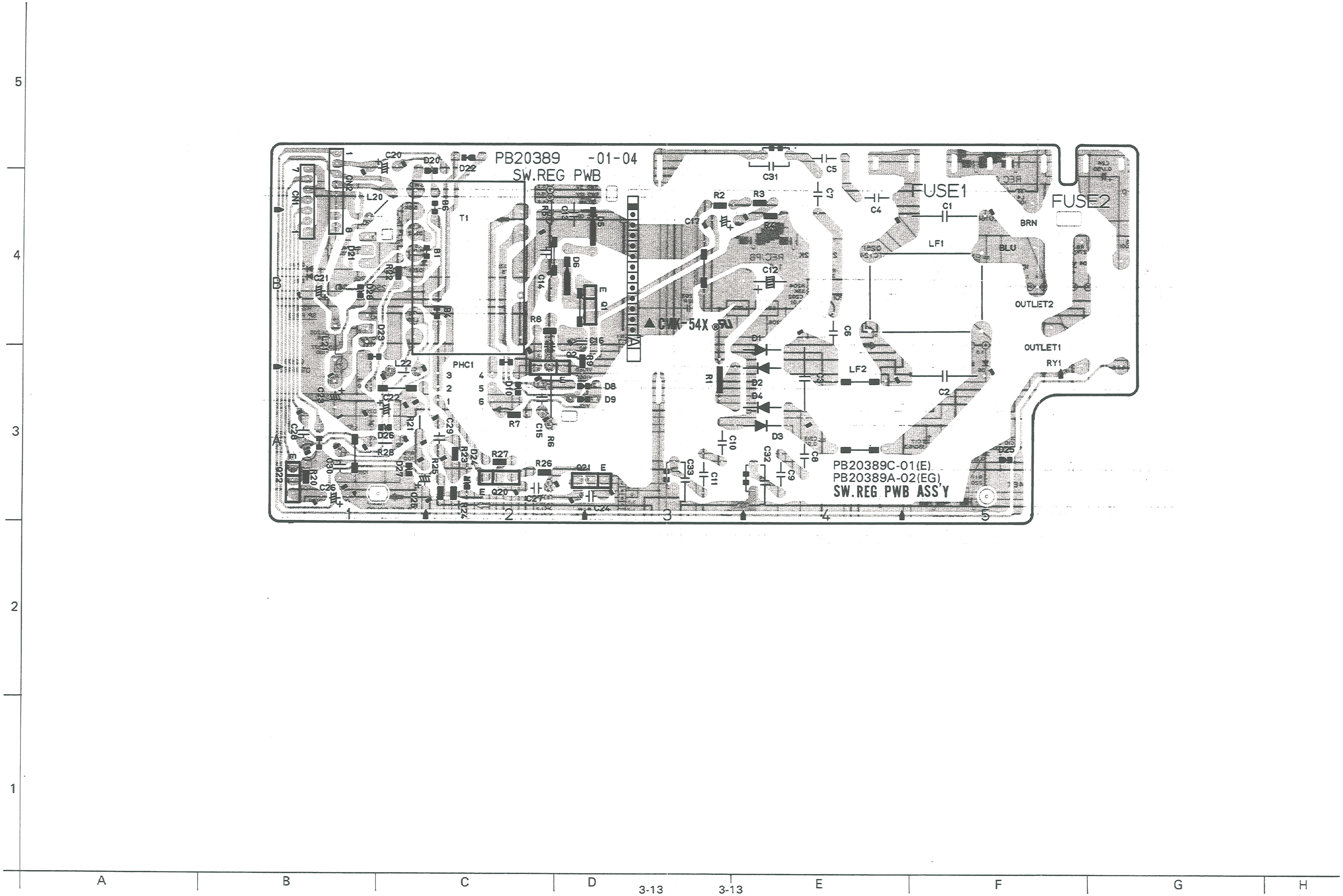

01 SWITCHING REGULATOR
03 REGULATOR (MAIN)
POC1
AC 220V~ 50/60Hz
AO1
AC OUTLET
F1 T1A
F2 T2A
RY1
D25
C2,C4,C5,C31 E model only
LF2 EG model only E model:short
C3,C6,C7 EG model only
LF1
LF2
D1~D4 10E6-F2
R1 2.2 2W
C32 E model only EG model:short
C33:E model only
C12 100/400
R2 330K
R4 56K
R3 330K
D5 AU01
D6 AG01
R5 100K 2W
C13 0.0047
C14 120P
C10 0.001/250
C11 0.001/250
C33 0.001/250
Q1
Q2
C17 1/50
C16 0.0047
R6 200 2W
C15 0.12
D8 AU01Z
R9 0.47 1W
R8 1K
R7 1K
Voltages are measured (reference to Emitter of Q2) with a degital voltmeter.
D10 MTZ16BT-77
T1
D20 AU01Z
D21 FML-12S
C20 47/63
C21 1500/16
D28
D28 MTZ13C
L20 33
C22 47/63
C25 33/35
C25 22/35
D27
R21 47 1/4W
FR
R20 2.2K
D27 MTZ30AT-77
D22 AU01Z
D23 FMB-24
L21 33
C23 2200/10
L22 15
C28 0.01
C30 0.01
Q22 2SA720
PHS1 PC111S
Q20
R26 330
R27 470
C27 0.01
Q21
R23 432
D24
C29 0.1
R22 2.7K
R25 820
R24 475
Q1 2SC4517A
Q2 2SC3616 (MLK)
Q20 2SA1267 (YG) -TJK
Q21 2SC1740S
D24 MTZV6.2A
CN2
CN801
AC ONLINE
45V
UNSW 12V
MOTOR 12V
GND
GND
GND (M)
7V
CN1
From/To SW/DISPLAY CN5 (Page 3-26)
GND
-28V
AC 4.6V
AC 4.6V
GND
-28V
GND
CP801,CP802 ICP-F38
CP803 ICP-F38
CP805 ICP-F20
C811 2200/10
C809 2200/16
C803 2200/16
Q801 2SB1068 (KU)
IC801 MC7805ACT
REG 5V
C807 0.01
C808 100/6.3
To 09 AUDIO,CN11 (Page 3-22)
CN802
SWD 5V
GND
UNSW12V
From/To 03 MECHACON,VIDEO,SERVO (MAIN) (Page 3-14,16,18)
Q805 DTB114ES
R809 1K
D803
R811 22 1/4W
R812 3.3K 2W
C801 10/63
L801 180
C812 180/16
C813 100/16
TP803 GND
R801 10K
C802 100/16
R802 2.2K
C804 100/16
C805 100/6.3
TP801 SWD 12V
R810 1.3K
R803 1K
Q802 2SD1856
Q803 2SD1796
Q804 2SC1740S
R804 560
TP802 SWD 5V
R805 220
D802 HZS3.9EB2
R807 470
R808 1.2K
C806 100/6.3
R807 SWD 5V ADJ
L851 10
L853 100
R851 39K
R852 1K
Q851
D851
D852
D853
Q851 2SA854S (R)
AC ONLINE
45V
UNSW 12V
UNSW 12V
MOTOR 12V
MOTOR 12V
GND
GND
GND (M)
GND (M)
POWER ON/OFF
SWD 12V
SWD 12V
UNSW 5.8V
SWD 5V
SWD 5V
SWD 5V
GND
UNSW 5V
UNSW 12V
SWD 12V
PB 12V
PB
5
4
3
2
1

NOTES: 1. Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

2. Voltages are DC-measured with a digital voltmeter during stop mode.

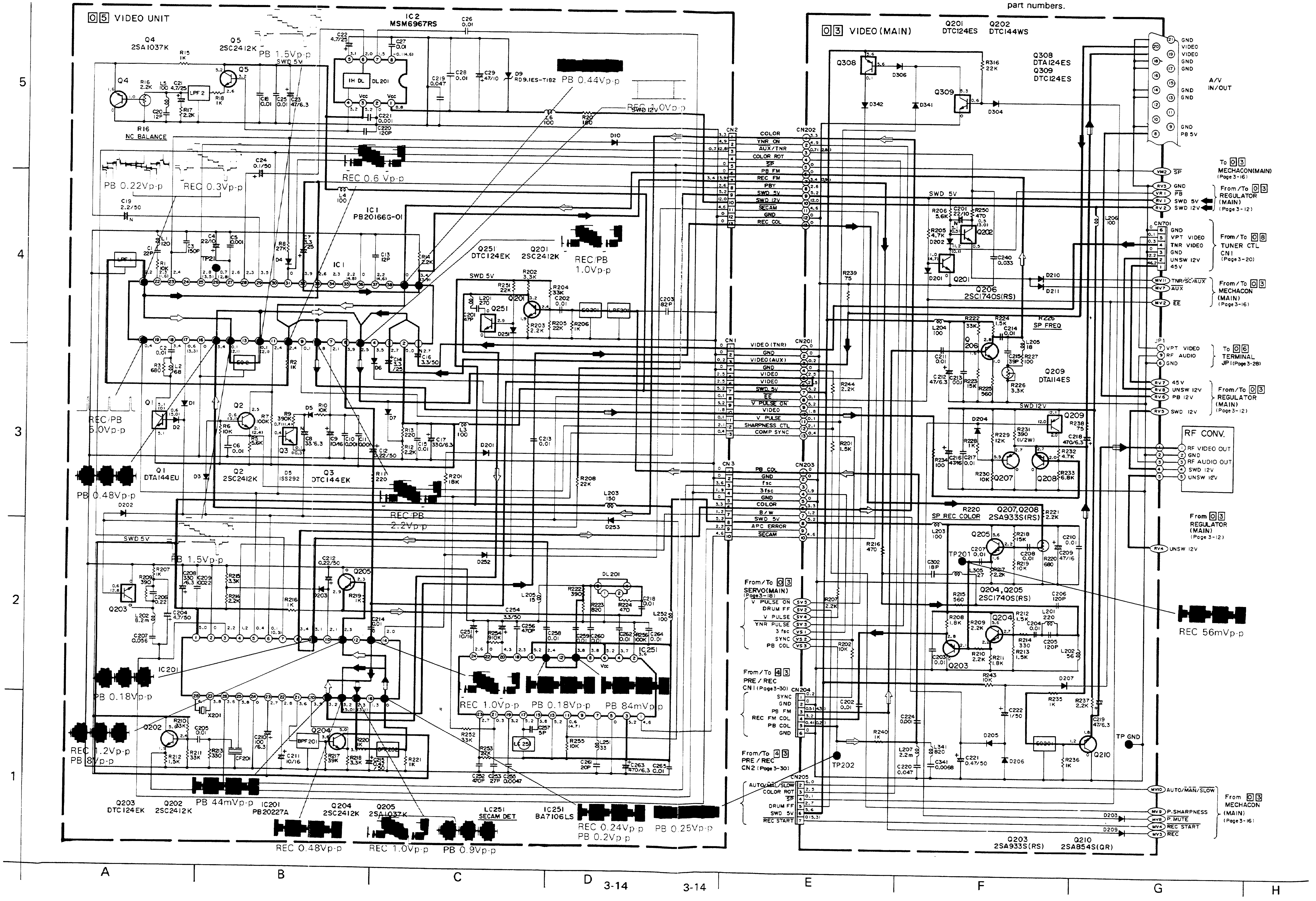
A B C D E F G H

3.12 SWITCHING REGULATOR CIRCUIT BOARD


PB20389 -01-04
SW.REG PWB
PB20389C-01(E)
PB20389A-02(EG)
SW.REG PWB ASS'Y
FUSE1
FUSE2
CN1
CN2
T1
PHC1
LF1
LF2
BRN
BLU
OUTLET1
OUTLET2
RY1
CWK-54X
C1
C2
C4
C5
C7
C8
C9
C10
C11
C12
C14
C15
C16
C17
C20
C21
C22
C24
C26
C27
C28
C29
C30
C31
C32
C33
R1
R2
R3
R6
R7
R8
R20
R21
R23
R24
R25
R26
R27
R28
D1
D2
D3
D4
D6
D8
D9
D10
D20
D21
D22
D23
D24
D25
D26
D27
Q1
Q20
Q21
Q22
L20
L22
E
A
B
1
2
3
4
5
6
7
5
4
3
2
1
A
B
C
D
E
F
G
H
3-13
3-13

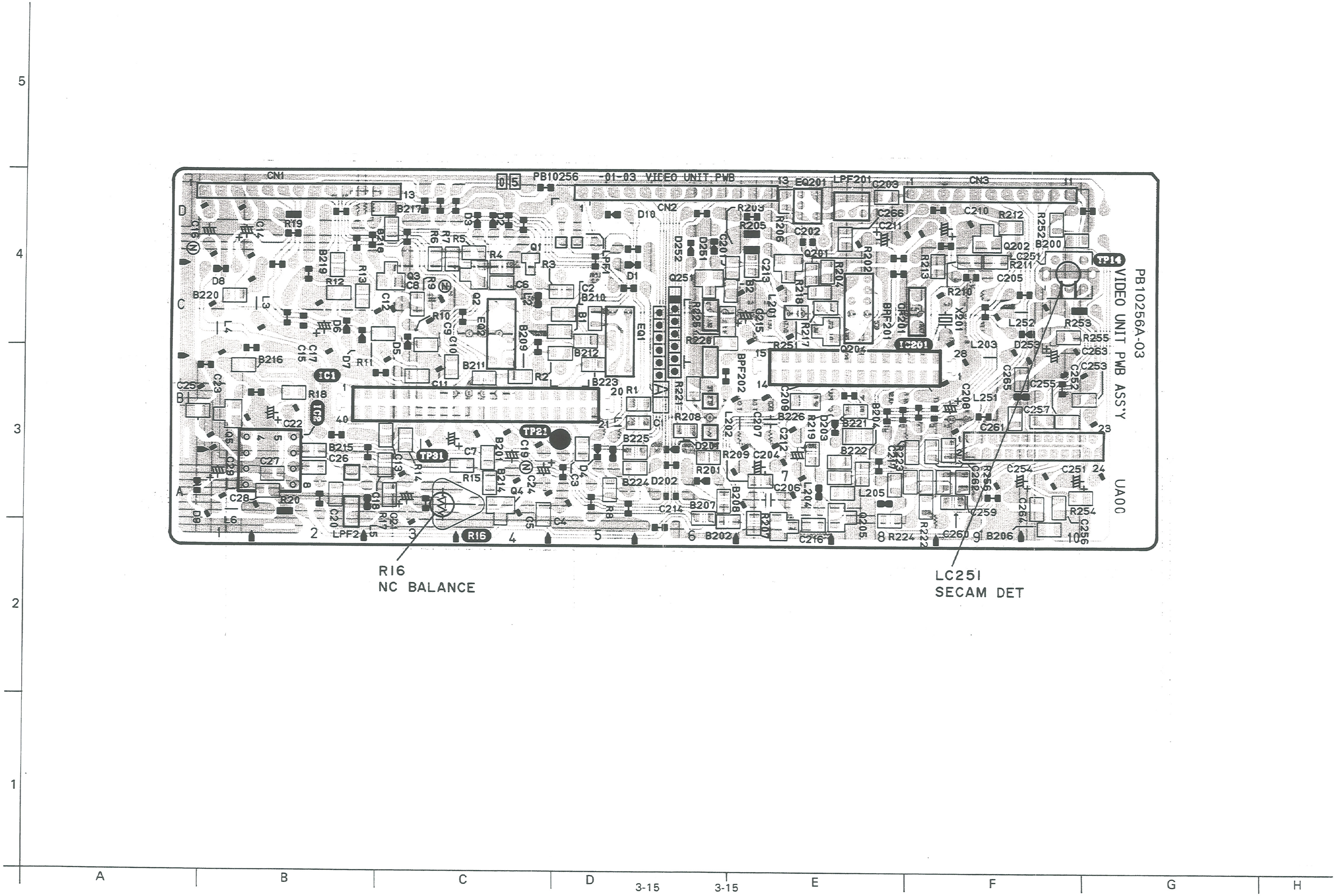
3.13 VIDEO UNIT AND VIDEO (MAIN) SCHEMATIC DIAGRAMS

NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

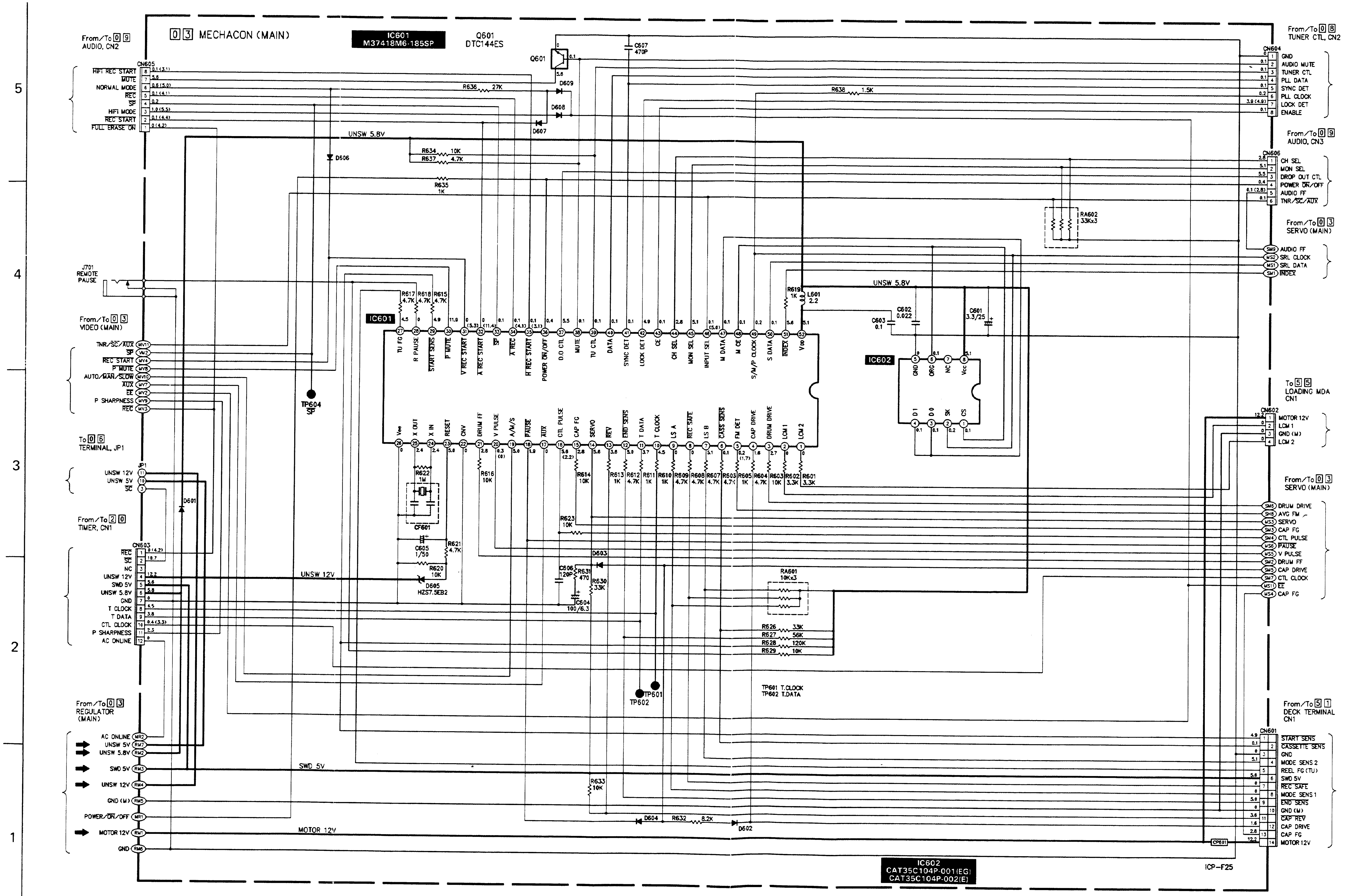


05 VIDEO UNIT
03 VIDEO (MAIN)
IC2 MSM6967RS
IC1 PB20166G-01
IC201 PB20227A
IC251 BA7106LS
LC251 SECAM DET
Q1 DTA144EU
Q2 2SC2412K
Q3 DTC144EK
Q4 2SA1037K
Q5 2SC2412K
D5 1SS292
Q202 2SC2412K
Q203 DTC124EK
Q204 2SC2412K
Q205 2SA1037K
Q251 DTC124EK
Q201 2SC2412K
Q201 DTC124ES
Q202 DTC144WS
Q308 DTA124ES
Q309 DTC124ES
Q206 2SC1740S(RS)
Q209 DTA114ES
Q207,Q208 2SA933S(RS)
Q204,Q205 2SC1740S(RS)
Q203 2SA933S(RS)
Q210 2SA854S(QR)
R16 NC BALANCE
PB 1.5Vp-p
PB 0.44Vp-p
REC 1.0Vp-p
PB 0.22Vp-p
REC 0.3Vp-p
REC 0.6 Vp-p
REC/PB 1.0Vp-p
REC/PB 5.0Vp-p
PB 0.48Vp-p
REC/PB 2.2Vp-p
PB 1.5Vp-p
PB 0.18Vp-p
REC 1.2Vp-p
PB 8Vp-p
PB 44mVp-p
REC 1.0Vp-p
PB 0.18Vp-p
PB 84mVp-p
REC 0.48Vp-p
REC 1.0Vp-p
PB 0.9Vp-p
REC 0.24Vp-p
PB 0.2Vp-p
PB 0.25Vp-p
REC 56mVp-p
CN2: COLOR, TNR ON, AUX/TNR, COLOR ROT, SP, PB FM, REC FM, PBY, SWD 5V, SWD 12V, SECAM, GND, REC COL
CN1: VIDEO (TNR), GND, VIDEO (AUX), GND, VIDEO, VIDEO, SWD 5V, EE, V PULSE ON, VIDEO, V PULSE, SHARPNESS CTL, COMP SYNC
CN3: PB COL, GND, fsc, 3fsc, GND, COLOR, B/W, SWD 5V, APC ERROR, SECAM
A/V IN/OUT
To 03 MECHACON(MAIN) (Page 3-16)
From/To 03 REGULATOR (MAIN) (Page 3-12)
From/To 08 TUNER CTL CN1 (Page 3-20)
From/To 03 MECHACON (MAIN) (Page 3-16)
To 06 TERMINAL JP1 (Page 3-28)
From/To 03 REGULATOR (MAIN) (Page 3-12)
RF CONV.
RF VIDEO OUT
GND
RF AUDIO OUT
SWD 12V
UNSW 12V
From 03 REGULATOR (MAIN) (Page 3-12)
From/To 03 SERVO(MAIN) (Page 3-18)
V PULSE ON, DRUM FF, V PULSE, YNR PULSE, 3 fsc, SYNC, PB COL
From/To 43 PRE/REC CN1 (Page 3-30)
From/To 43 PRE/REC CN2 (Page 3-30)
AUTO/MAN/SLOW, COLOR ROT, SP, DRUM FF, SWD 5V, REC START
From 03 MECHACON (MAIN) (Page 3-16)
P.SHARPNESS, P.MUTE, REC START, REC
SP FREQ
SP REC COLOR
TP201
TP202
TP GND
A B C D E F G H
5 4 3 2 1

3.14 VIDEO UNIT CIRCUIT BOARD

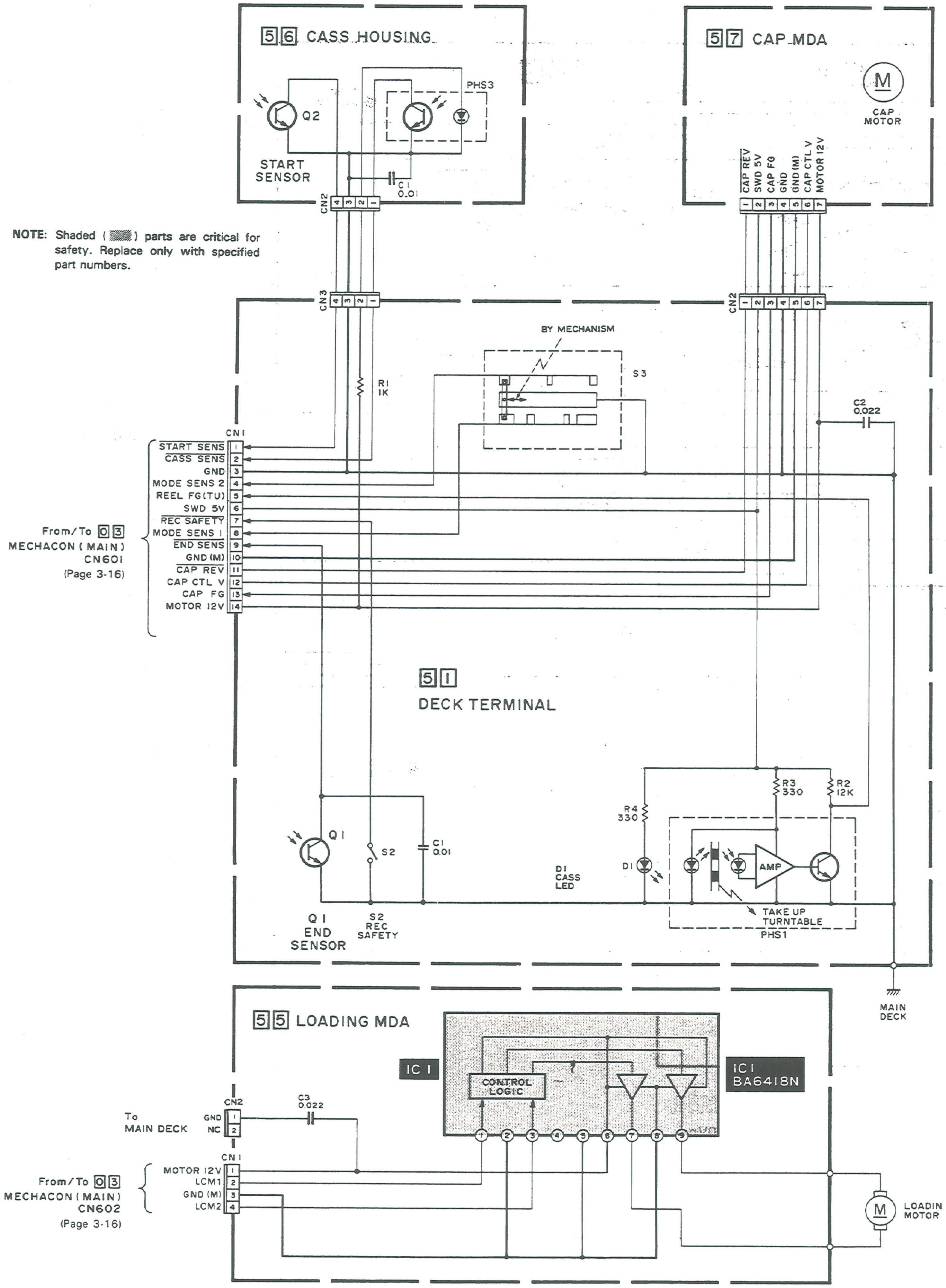

R16
NC BALANCE
LC251
SECAM DET
PB10256A-03
VIDEO UNIT PWB ASS'Y
UA00
PB10256 -01-03 VIDEO UNIT PWB
CN1
CN2
CN3
IC1
IC201
TP14
TP21
TP31
A
B
C
D
E
F
G
H
1
2
3
4
5

3.15 MECHACON (MAIN) SCHEMATIC DIAGRAM


03 MECHACON (MAIN)
IC601 M37418M6-185SP
Q601 DTC144ES
From/To 09 AUDIO, CN2
CN605
HIFI REC START
MUTE
NORMAL MODE
REC
SP
HIFI MODE
REC START
FULL ERASE ON
UNSW 5.8V
R636 27K
R638 1.5K
D609
D608
D607
D606
C607 470P
R634 10K
R637 4.7K
R635 1K
J701 REMOTE PAUSE
From/To 03 VIDEO (MAIN)
TNR/SC/AUX
SP
REC START
P MUTE
AUTO/MAN/SLOW
AUX
EE
P SHARPNESS
REC
TP604 SP
To 06 TERMINAL, JP1
JP1
UNSW 12V
UNSW 5V
SC
D601
From/To 20 TIMER, CN1
CN603
REC
SC
NC
UNSW 12V
SWD 5V
UNSW 5.8V
GND
T CLOCK
T DATA
CTL CLOCK
P SHARPNESS
AC ONLINE
From/To 03 REGULATOR (MAIN)
AC ONLINE
UNSW 5V
UNSW 5.8V
SWD 5V
UNSW 12V
GND (M)
POWER ON/OFF
MOTOR 12V
GND
R617 4.7K
R618 4.7K
R615 4.7K
IC601
TU FG
R PAUSE
START SENS
P MUTE
V REC START
A REC START
SP
A REC
H REC START
POWER ON/OFF
D.O CTL
MUTE
TU CTL
DATA
SYNC DET
LOCK DET
CE
CH SEL
MON SEL
INPUT SEL
M DATA
M CE
S/A/P CLOCK
S DATA
INDEX
Vdd
Vss
X OUT
X IN
RESET
CNV
DRUM FF
V PULSE
A/M/S
PAUSE
AUX
CTL PULSE
CAP FG
SERVO
REV
END SENS
T DATA
T CLOCK
LS A
REC SAFE
LS B
CASS SENS
FM DET
CAP DRIVE
DRUM DRIVE
LCM 1
LCM 2
R622 1M
CF601
C605 1/50
R621 4.7K
R620 10K
D605 HZS7.5EB2
R616 10K
R614 10K
R613 1K
R612 4.7K
R611 1K
R610 1K
R609 4.7K
R608 4.7K
R607 4.7K
R603 4.7K
R605 1K
R604 4.7K
R603 10K
R602 3.3K
R601 3.3K
R623 10K
D603
C606 120P
R631 470
R630 3.3K
C604 100/6.3
UNSW 12V
RA601 10Kx3
R626 33K
R627 56K
R628 120K
R629 10K
TP601
TP602
TP601 T.CLOCK
TP602 T.DATA
SWD 5V
R633 10K
D604
R632 8.2K
D602
MOTOR 12V
R619 1K
L601 2.2
UNSW 5.8V
C603 0.1
C602 0.022
C601 3.3/25
IC602
GND
ORG
NC
Vcc
DI
DO
SK
CS
RA602 33Kx3
From/To 08 TUNER CTL, CN2
CN604
GND
AUDIO MUTE
TUNER CTL
PLL DATA
SYNC DET
PLL CLOCK
LOCK DET
ENABLE
From/To 09 AUDIO, CN3
CN606
CH SEL
MON SEL
DROP OUT CTL
POWER ON/OFF
AUDIO FF
TNR/SC/AUX
From/To 03 SERVO (MAIN)
AUDIO FF
SRL CLOCK
SRL DATA
INDEX
To 55 LOADING MDA CN1
CN602
MOTOR 12V
LCM 1
GND (M)
LCM 2
From/To 03 SERVO (MAIN)
DRUM DRIVE
AVG FM
SERVO
CAP FG
CTL PULSE
PAUSE
V PULSE
DRUM FF
CAP DRIVE
CTL CLOCK
EE
CAP FG
From/To 51 DECK TERMINAL CN1
CN601
START SENS
CASSETTE SENS
GND
MODE SENS 2
REEL FG (TU)
SWD 5V
REC SAFE
MODE SENS 1
END SENS
GND (M)
CAP REV
CAP DRIVE
CAP FG
MOTOR 12V
CP601
ICP-F25
IC602 CAT35C104P-001(EG) CAT35C104P-002(E)
1
2
3
4
5
A
B
C
D
E
F
G
H

NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

3.16 DECK TERMINAL, LOADING MDA, CAPSTAN MDA AND CASS. HOUSING SCHEMATIC DIAGRAMS



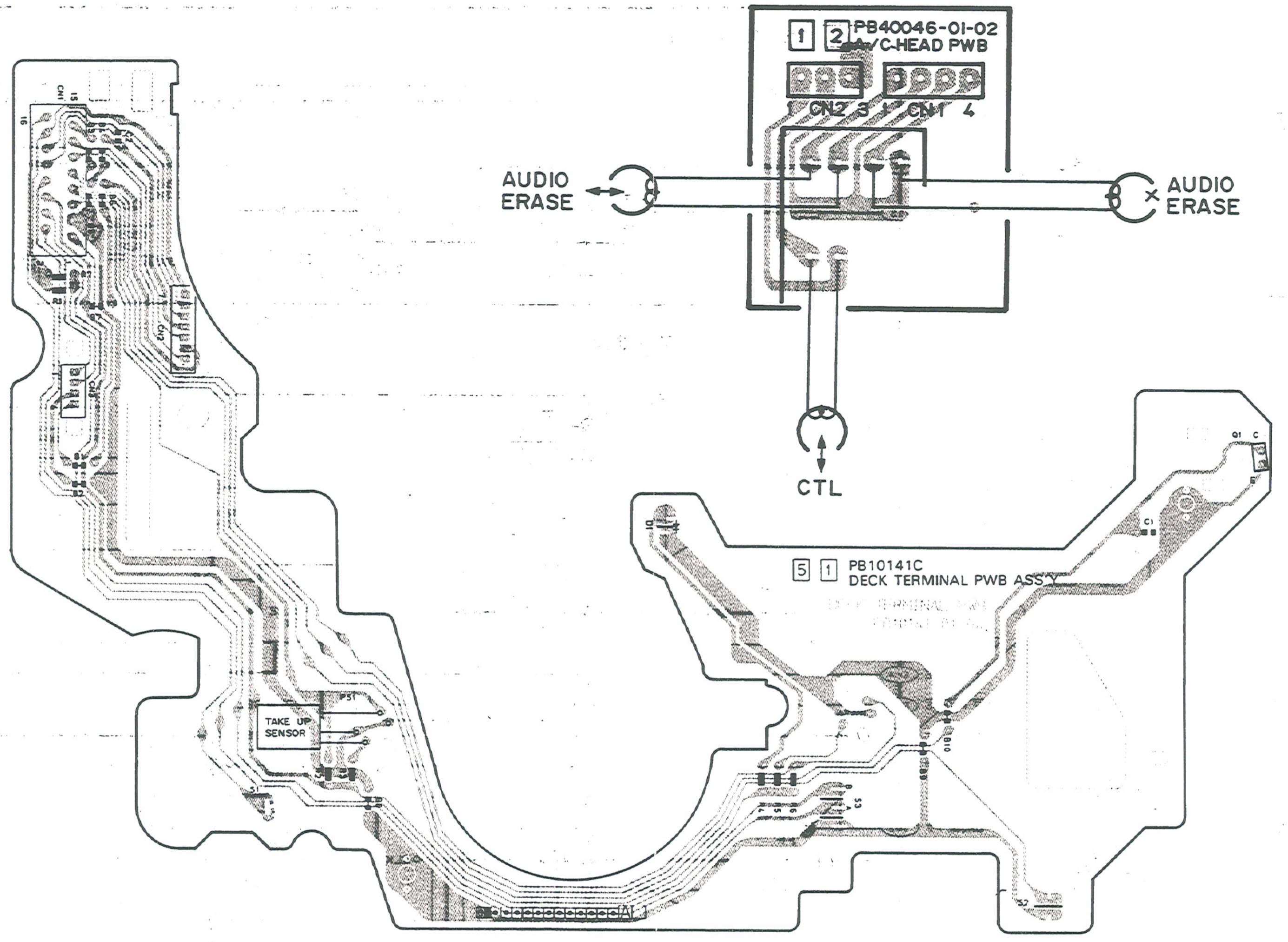
5 6 CASS HOUSING
Q2
PHS3
START SENSOR
C1 0.01
CN2
5 7 CAP MDA
M
CAP MOTOR
CAP REV
SWD 5V
CAP FG
GND
GND (M)
CAP CTL V
MOTOR 12V
CN3
CN2
BY MECHANISM
S3
R1 1K
C2 0.022
CN1
START SENS
CASS SENS
GND
MODE SENS 2
REEL FG(TU)
SWD 5V
REC SAFETY
MODE SENS 1
END SENS
CAP REV
GND (M)
CAP CTL V
CAP FG
MOTOR 12V
From/To 0 3 MECHACON (MAIN) CN601 (Page 3-16)
5 1 DECK TERMINAL
R3 330
R2 12K
R4 330
Q1
S2
C1 0.01
D1
D1 CASS LED
AMP
TAKE UP TURNTABLE
PHS1
Q1 END SENSOR
S2 REC SAFETY
MAIN DECK
5 5 LOADING MDA
IC1
CONTROL LOGIC
IC1 BA6418N
To MAIN DECK
CN2
GND
NC
C3 0.022
CN1
MOTOR 12V
LCM1
GND (M)
LCM2
From/To 0 3 MECHACON (MAIN) CN602 (Page 3-16)
M
LOADIN MOTOR

NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

3.17 DECK TERMINAL, LOADING MDA, CASS. HOUSING AND A/CTL HEAD CIRCUIT BOARDS

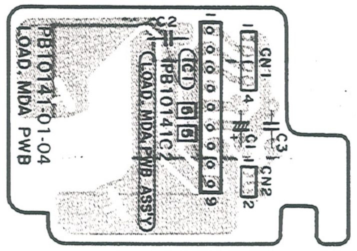
– DECK TERMINAL –

– A/CTL HEAD –



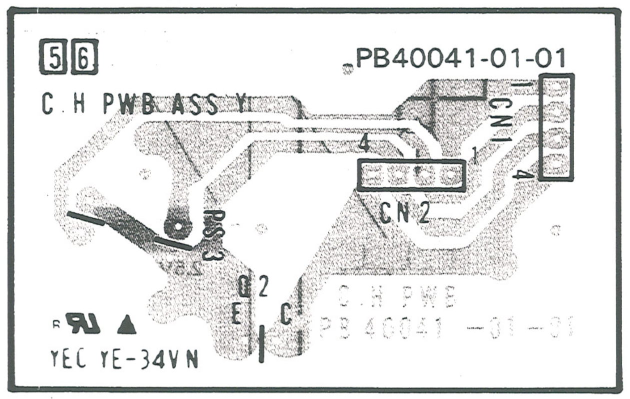
1 2 PB40046-01-02 A/C-HEAD PWB
CN2 3
CN1 4
AUDIO ERASE
AUDIO ERASE
CTL
TAKE UP SENSOR
5 1 PB10141C DECK TERMINAL PWB ASS'Y

– LOADING MDA –



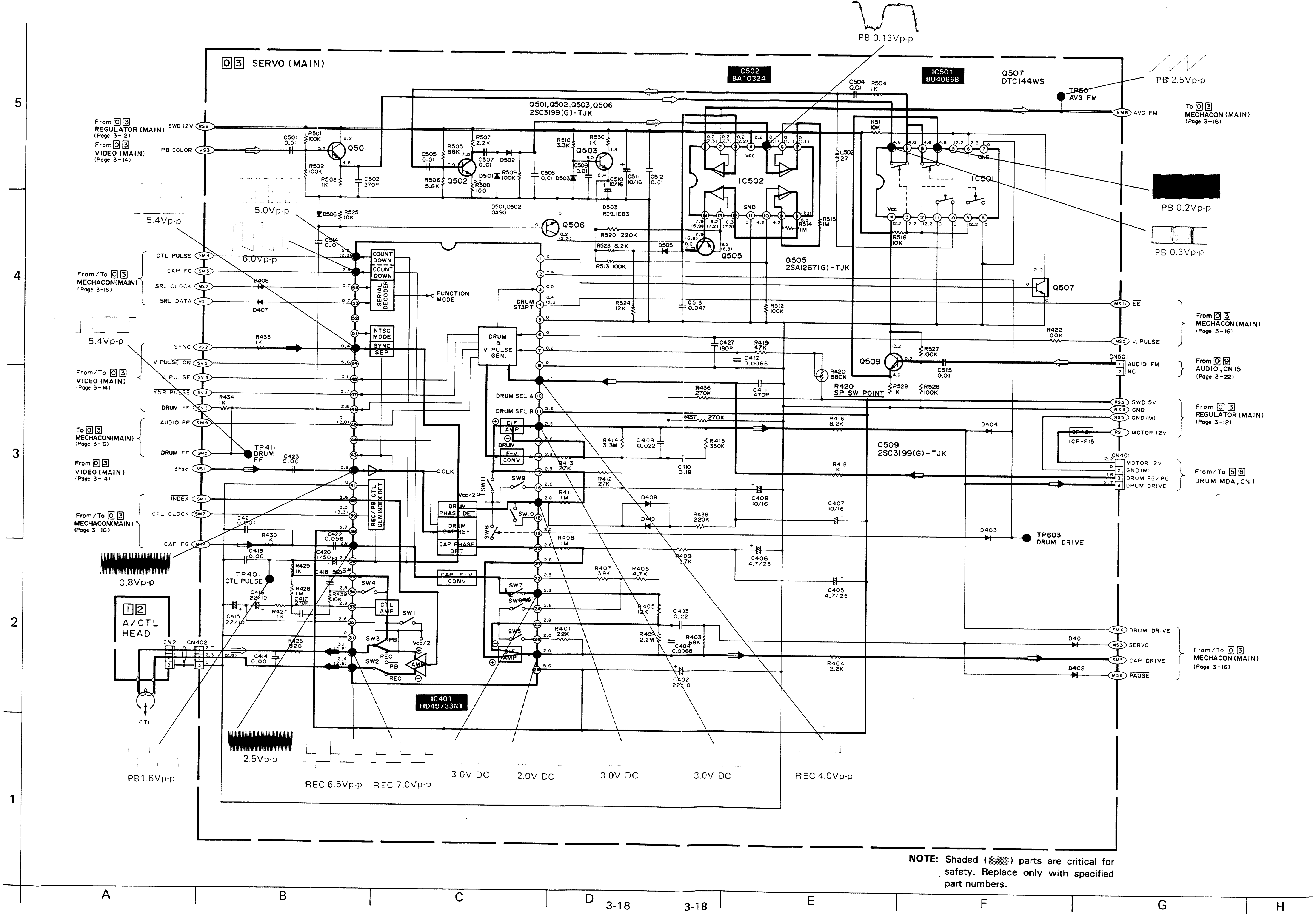
PB10141-01-04 LOAD, MDA PWB
C2
IC1
PB10141C2
LOAD, MDA PWB ASS'Y
5 5
CN1
C1
C3
CN2

– CASSETTE HOUSING –



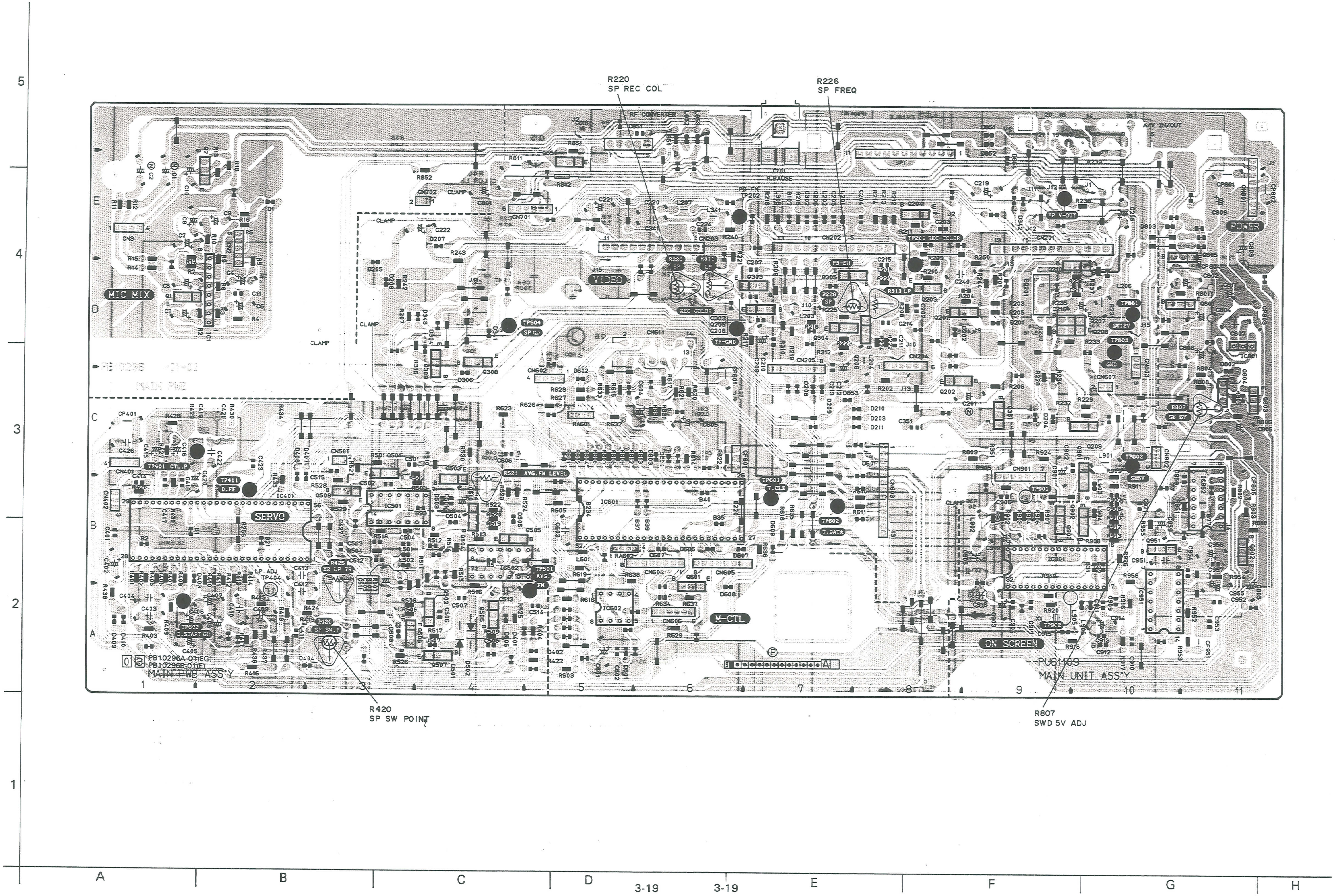
5 6
PB40041-01-01
C H PWB ASS Y
CN1
CN2
PHS3
Q2
E C
C H PWB
PB40041-01-01
YEC YE-34VN

3.18 SERVO (MAIN) SCHEMATIC DIAGRAM


03 SERVO (MAIN)
IC502 BA10324
IC501 BU4066B
Q507 DTC144WS
IC401 HD49733NT
Q501,Q502,Q503,Q506 2SC3199(G)-TJK
Q505 2SA1267(G)-TJK
Q509 2SC3199(G)-TJK
D501,D502 0A90
D503 RD9.1EB3
PB 0.13Vp-p
PB 2.5Vp-p
PB 0.2Vp-p
PB 0.3Vp-p
5.4Vp-p
5.0Vp-p
6.0Vp-p
0.8Vp-p
2.5Vp-p
PB1.6Vp-p
REC 6.5Vp-p
REC 7.0Vp-p
3.0V DC
2.0V DC
3.0V DC
3.0V DC
REC 4.0Vp-p
From 03 REGULATOR (MAIN) (Page 3-12)
From 03 VIDEO (MAIN) (Page 3-14)
SWD 12V
PB COLOR
From/To 03 MECHACON(MAIN) (Page 3-16)
CTL PULSE
CAP FG
SRL CLOCK
SRL DATA
From/To 03 VIDEO (MAIN) (Page 3-14)
SYNC
V PULSE ON
V PULSE
YNR PULSE
DRUM FF
To 03 MECHACON(MAIN) (Page 3-16)
AUDIO FF
DRUM FF
From 03 VIDEO (MAIN) (Page 3-14)
3Fsc
From/To 03 MECHACON(MAIN) (Page 3-16)
INDEX
CTL CLOCK
CAP FG
12 A/CTL HEAD
CN2
CN402
CTL
TP401 CTL PULSE
TP411 DRUM FF
TP501 AVG FM
TP603 DRUM DRIVE
COUNT DOWN
COUNT DOWN
SERIAL DECODER
FUNCTION MODE
NTSC MODE
SYNC SEP
DRUM & V PULSE GEN.
DRUM START
DRUM SEL A
DRUM SEL B
DIF AMP
DRUM F-V CONV
DRUM PHASE DET
DRUM CAP REF
CAP PHASE DET
CAP F-V CONV
REC/PB CTL GEN INDEX DET
CTL AMP
AMP
CLK
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
Vcc/2
PB
REC
R420 SP SW POINT
R420 680K
To 03 MECHACON (MAIN) (Page 3-16)
AVG FM
EE
V. PULSE
From 03 MECHACON (MAIN) (Page 3-16)
CN501
AUDIO FM
NC
From 09 AUDIO,CN15 (Page 3-22)
SWD 5V
GND
GND(M)
MOTOR 12V
From 03 REGULATOR (MAIN) (Page 3-12)
CP401 ICP-F15
CN401
MOTOR 12V
GND(M)
DRUM FG/PG
DRUM DRIVE
From/To 58 DRUM MDA, CN1
DRUM DRIVE
SERVO
CAP DRIVE
PAUSE
From/To 03 MECHACON (MAIN) (Page 3-16)
D401
D402
D403
D404
D407
D408
D409
D410
D505
D506
R501 100K
R502 100K
R503 1K
R505 68K
R506 5.6K
R507 2.2K
R508 100
R509 100K
R510 3.3K
R511 10K
R512 100K
R513 100K
R514 1M
R515 1M
R518 10K
R520 220K
R523 8.2K
R524 12K
R525 10K
R527 100K
R528 100K
R529 1K
R530 1K
C501 0.01
C502 270P
C504 0.01
R504 1K
C505 0.01
C507 0.01
C508 0.01
C509 0.01
C510 10/16
C511 10/16
C512 0.01
C513 0.047
C514 0.01
C515 0.01
L502 27
R401 22K
R402 2.2M
R403 68K
R404 2.2K
R405 12K
R406 4.7K
R407 3.9K
R408 1M
R409 4.7K
R411 1M
R412 27K
R413 27K
R414 3.3M
R415 330K
R416 8.2K
R418 1K
R419 47K
R422 100K
R426 820
R427 1K
R428 1M
R429 1K
R430 1K
R434 1K
R435 1K
R436 270K
R437 270K
R438 220K
R439 10K
C402 22/10
C403 0.12
C404 0.0068
C405 4.7/25
C406 4.7/25
C407 10/16
C408 10/16
C409 0.022
C410 0.18
C411 470P
C412 0.0068
C414 0.001
C415 22/10
C416 22/10
C417 470P
C418 560P
C419 0.001
C420 1/50
C421 0.001
C422 0.056
C423 0.001
C427 180P
Vcc
GND
A
B
C
D
E
F
G
H
1
2
3
4
5

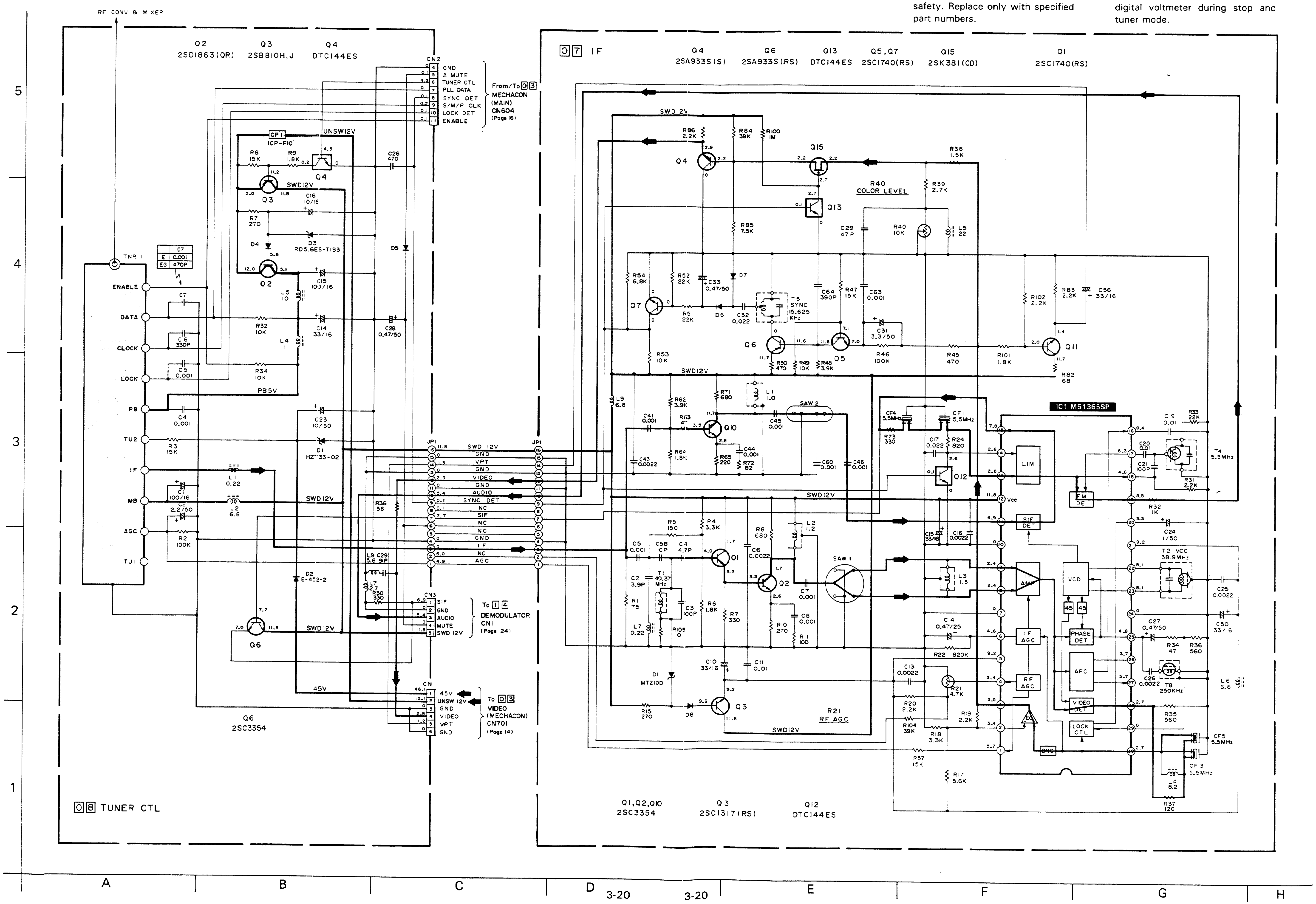
NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

3.19 MAIN CIRCUIT BOARD

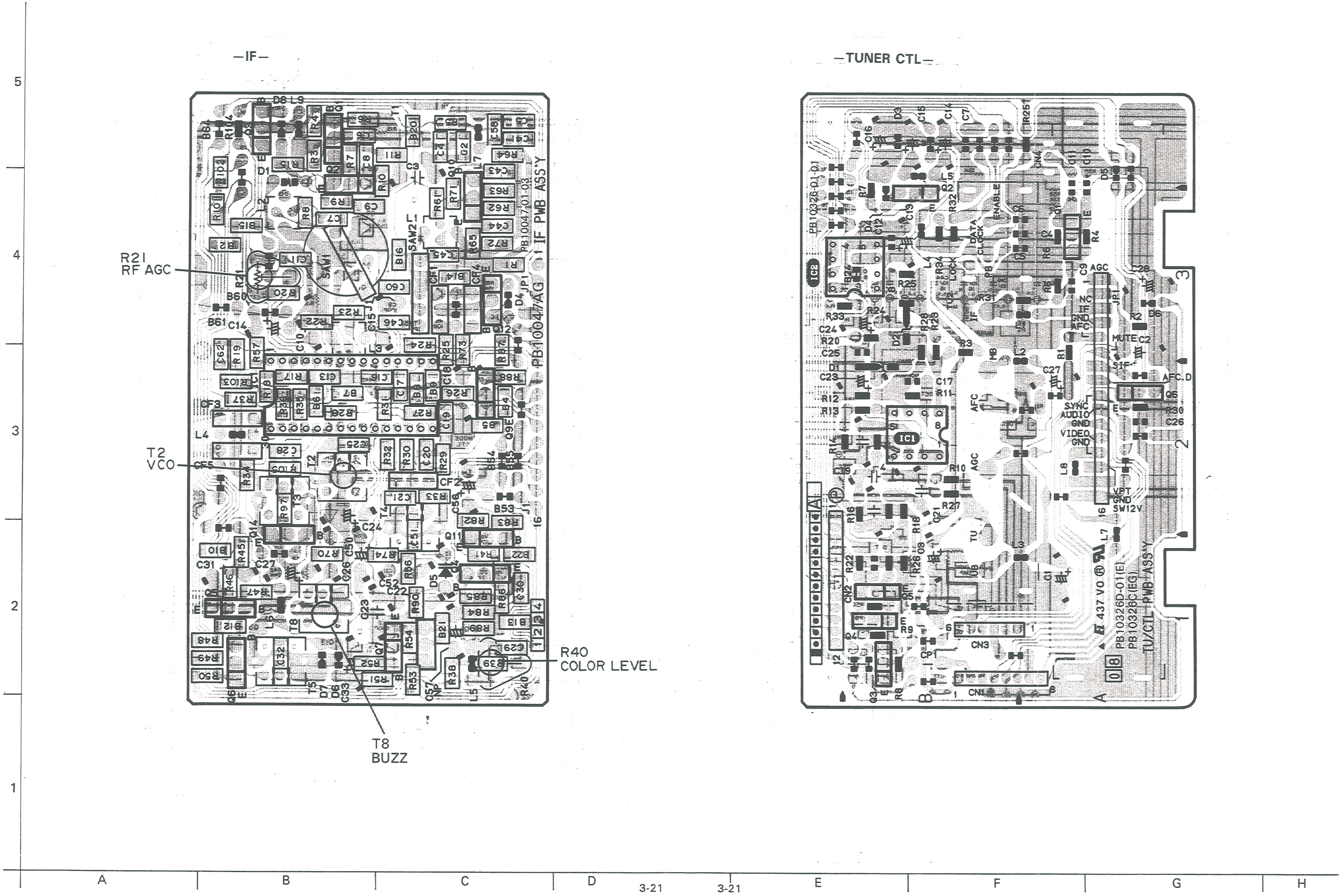

R220
SP REC COL
R226
SP FREQ
RF CONVERTER
A/V IN/OUT
POWER
MIC MIX
VIDEO
REC COLOR
SERVO
M-CTL
ON SCREEN
PB10296A-01(EG)
PB10296B-01(E)
MAIN PWB ASS'Y
PU61409
MAIN UNIT ASS'Y
R420
SP SW POINT
R807
SWD 5V ADJ
5
4
3
2
1
A
B
C
D
E
F
G
H

3.20 IF & TNR CTL SCHEMATIC DIAGRAMS

NOTES:
1. Shaded (▒) parts are critical for safety. Replace only with specified part numbers.
2. Voltages are DC-measured with a digital voltmeter during stop and tuner mode.

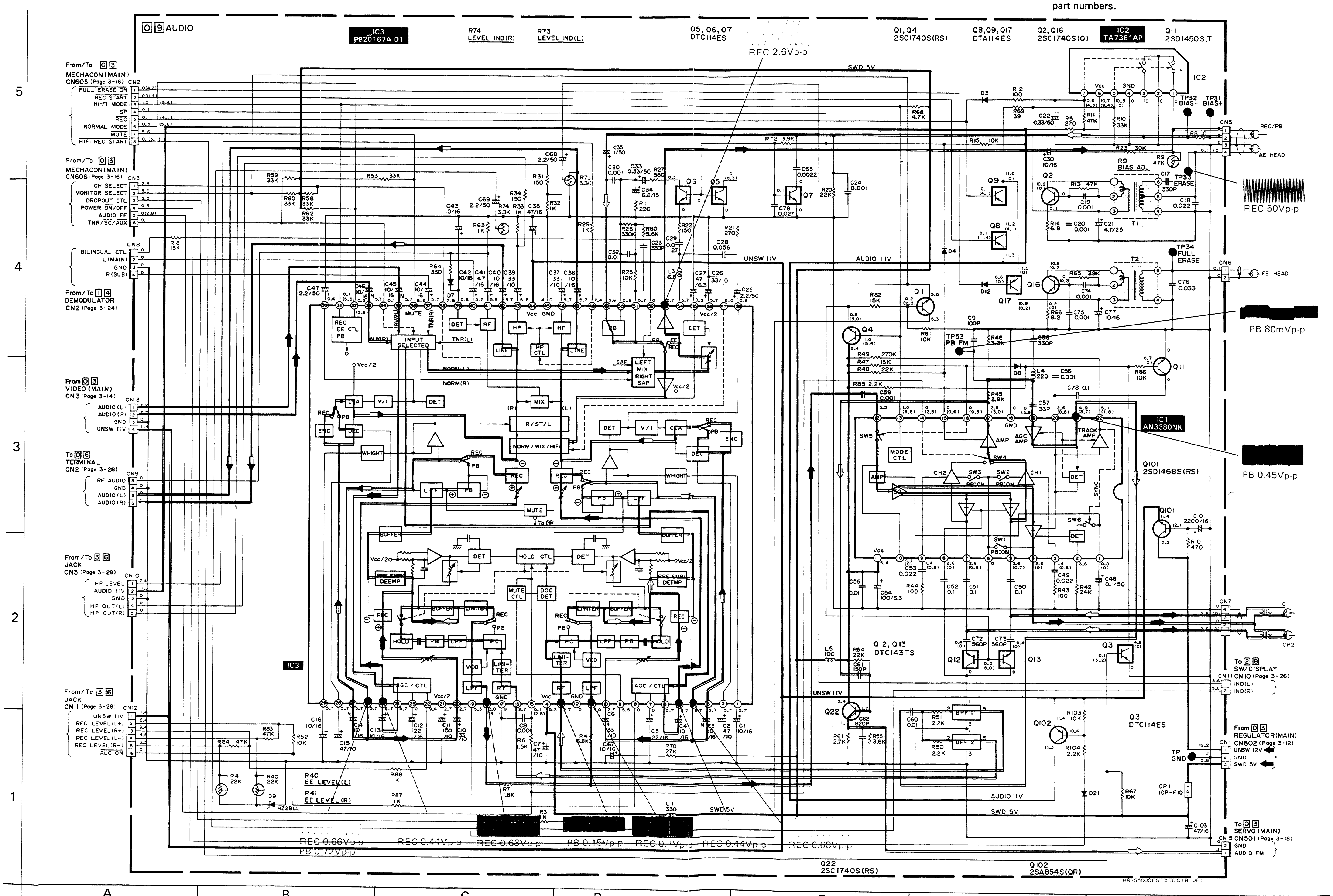

RF CONV & MIXER
Q2 2SD1863(QR)
Q3 2SB810H,J
Q4 DTC144ES
CN2
GND
A MUTE
TUNER CTL
PLL DATA
SYNC DET
S/M/P CLK
LOCK DET
ENABLE
From/To 03 MECHACON (MAIN) CN604 (Page 16)
CP1 ICP-F10
UNSW12V
SWD12V
R8 15K
R9 1.8K
C26 470
C16 10/16
R7 270
D3 RD5.6ES-T1B3
D4
D5
C15 100/16
L5 10
C14 33/16
C28 0.47/50
L4 1
R32 10K
R34 10K
PB5V
C23 10/50
D1 HZT33-02
TNR 1
C7
E 0.001
EG 470P
ENABLE
DATA
CLOCK
LOCK
PB
TU2
IF
MB
AGC
TU1
C6 330P
C5 0.001
C4 0.001
R3 15K
L1 0.22
C1 100/16
C2 2.2/50
L2 6.8
R2 100K
R36 56
D2 E-452-2
L9 C29 5.6 91P
L7 2.7
R30 330
CN3
SIF
GND
AUDIO
MUTE
SWD 12V
To 14 DEMODULATOR CN1 (Page 24)
JP1
SWD 12V
GND
VPT
VIDEO
AUDIO
SYNC DET
NC
SIF
IF
AGC
CN1
45V
UNSW 12V
VIDEO
VPT
To 03 VIDEO (MECHACON) CN701 (Page 14)
Q6
Q6 2SC3354
08 TUNER CTL
07 IF
Q4 2SA933S(S)
Q6 2SA933S(RS)
Q13 DTC144ES
Q5,Q7 2SC1740(RS)
Q15 2SK381(CD)
Q11 2SC1740(RS)
R86 2.2K
R84 39K
R100 1M
R38 1.5K
R40 COLOR LEVEL
R39 2.7K
R85 7.5K
C29 47P
R40 10K
L5 22
R54 6.8K
R52 22K
C33 0.47/50
D7
T5 SYNC 15.625 KHz
C64 390P
R47 15K
C63 0.001
R102 2.2K
R83 2.2K
C56 33/16
Q7
R51 22K
D6
C32 0.022
C31 3.3/50
R53 10K
R50 470
R49 10K
R48 3.9K
Q5
R46 100K
R45 470
R101 1.8K
Q11
R82 68
L9 6.8
R62 3.9K
R71 680
L1 1.0
SAW 2
C41 0.001
R63 47
Q10
C45 0.001
C43 0.0022
R64 1.8K
R65 220
R72 82
C44 0.001
C60 0.001
C46 0.001
CF4 5.5MHz
CF1 5.5MHz
R73 330
C17 0.022
R24 820
Q12
IC1 M51365SP
LIM
FM DE
SIF DET
Vcc
IF AMP
VCO
PHASE DET
AFC
VIDEO DET
LOCK CTL
IF AGC
RF AGC
C19 0.01
R33 22K
C20 0.01
C21 100P
T4 5.5MHz
R31 2.2K
R32 1K
C24 1/50
T2 VCO 38.9MHz
C25 0.0022
C27 0.47/50
C50 33/16
R34 47
R36 560
C26 0.0022
T8 250KHz
L6 6.8
R35 560
CF5 5.5MHz
CF3 5.5MHz
L4 8.2
R37 120
R5 150
R4 3.3K
C5 0.001
C58 10P
C4 4.7P
R8 680
L2 1.2
Q1
C6 0.0022
SAW 1
C2 3.9P
T1 40.37 MHz
Q2
C7 0.001
L3 1.5
R1 75
C3 100P
R6 1.8K
R7 330
R10 270
C8 0.001
R11 100
L7 0.22
R105 0
C14 0.47/25
R22 820K
C13 0.0022
R21 4.7K
R20 2.2K
R19 2.2K
R104 39K
R18 3.3K
R57 15K
R17 5.6K
C15 33/16
C16 0.0022
C10 33/16
C11 0.01
D1 MTZ10D
Q3
R15 270
D8
R21 RF AGC
SWD12V
Q1,Q2,Q10 2SC3354
Q3 2SC1317(RS)
Q12 DTC144ES
A
B
C
D
E
F
G
H
1
2
3
4
5

3.21 IF & TNR CTL CIRCUIT BOARDS


—IF—
—TUNER CTL—
R21
RF AGC
T2
VCO
T8
BUZZ
R40
COLOR LEVEL
PB10047/01-03 IF PWB ASS'Y
TU/CTL PWB ASS'Y
5
4
3
2
1
A
B
C
D
E
F
G
H

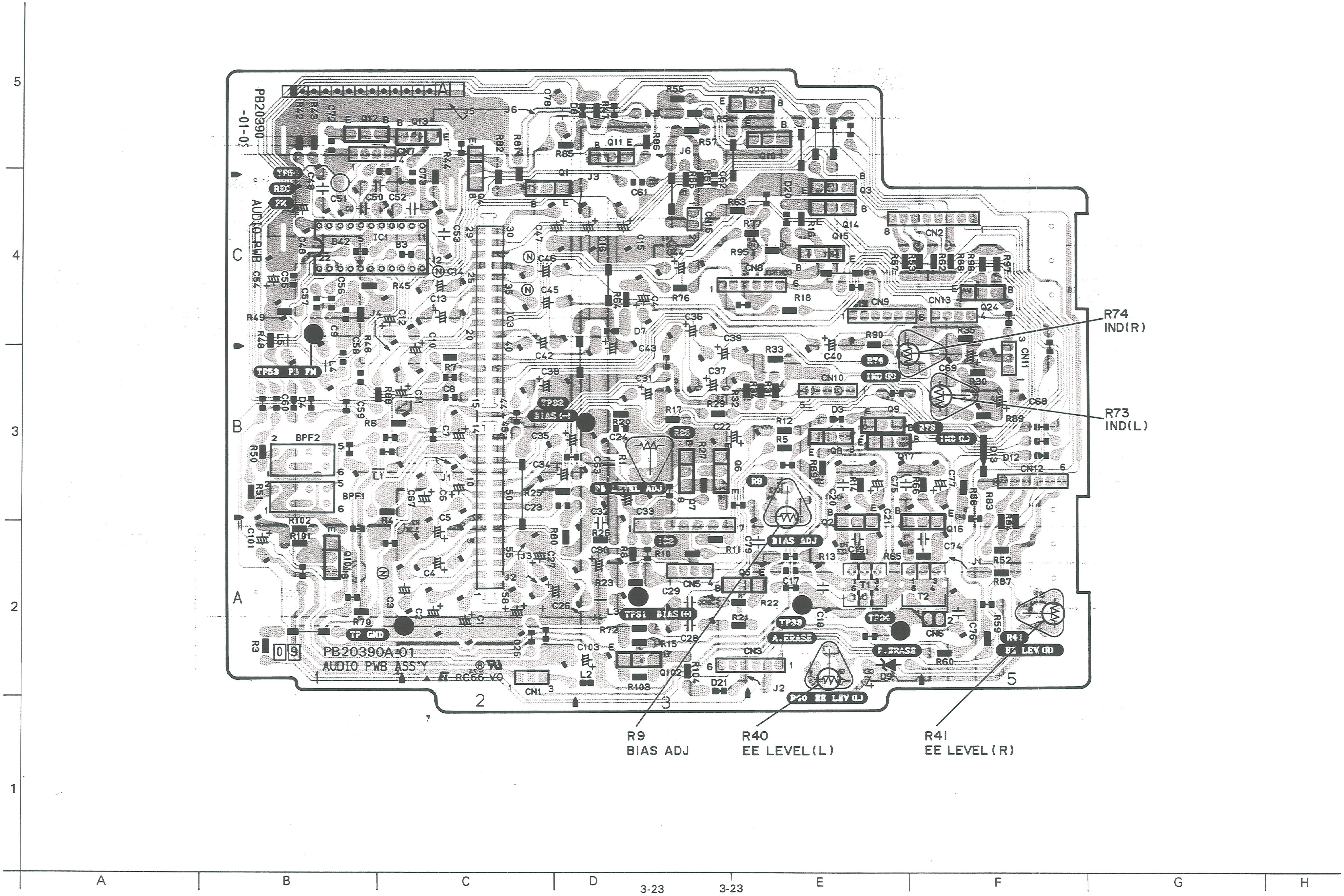
3.22 AUDIO SCHEMATIC DIAGRAM

NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

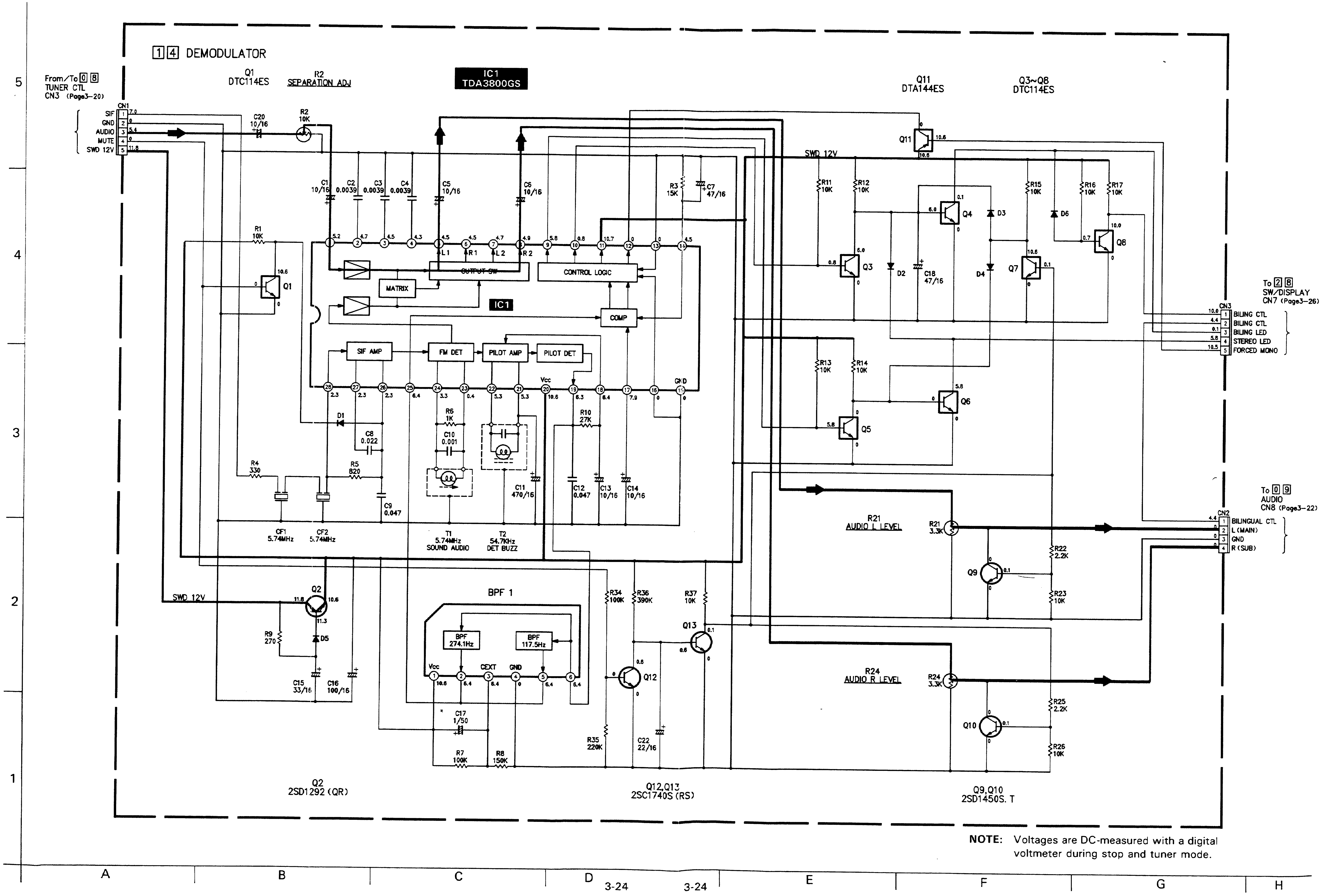


09 AUDIO
IC3 PB20167A 01
R74 LEVEL IND(R)
R73 LEVEL IND(L)
Q5, Q6, Q7 DTC114ES
REC 2.6Vp-p
Q1, Q4 2SC1740S(RS)
Q8, Q9, Q17 DTA114ES
Q2, Q16 2SC1740S(Q)
IC2 TA7361AP
Q11 2SD1450S,T
From/To 03 MECHACON (MAIN) CN605 (Page 3-16) CN2
FULL ERASE ON
REC START
HI-FI MODE
SP
REC
NORMAL MODE
MUTE
HIFI REC START
From/To 03 MECHACON (MAIN) CN606 (Page 3-16) CN3
CH SELECT
MONITOR SELECT
DROPOUT CTL
POWER ON/OFF
AUDIO FF
TNR/SC/AUX
CN8
BILINGUAL CTL
L(MAIN)
GND
R(SUB)
From/To 14 DEMODULATOR CN2 (Page 3-24)
From 03 VIDEO (MAIN) CN3 (Page 3-14) CN13
AUDIO (L)
AUDIO (R)
GND
UNSW 11V
To 06 TERMINAL CN2 (Page 3-28) CN9
RF AUDIO
GND
AUDIO (L)
AUDIO (R)
From/To 36 JACK CN3 (Page 3-28) CN10
HP LEVEL
AUDIO 11V
GND
HP OUT (L)
HP OUT (R)
From/To 36 JACK CN1 (Page 3-28) CN12
UNSW 11V
REC LEVEL (L+)
REC LEVEL (R+)
REC LEVEL (L-)
REC LEVEL (R-)
ALC ON
SWD 5V
UNSW 11V
AUDIO 11V
INPUT SELECTED
MUTE
REC EE CTL PB
DET
RF
HP
HP CTL
LINE
PB
CET
LEFT MIX RIGHT SAP
NORM(L)
NORM(R)
MIX
R/ST/L
NORM/MIX/HIFI
V/I
CCA
ENC
DEC
WHIGHT
LPF
REC
PB
BUFFER
HOLD CTL
PRE EMP/DEEMP
MUTE CTL
DOC DET
LIMITER
HOLD
PC
VCO
LIMITER
AGC/CTL
IC3
REC EE CTL
R40 EE LEVEL (L)
R41 EE LEVEL (R)
D9 HZ28LL
L1 330
REC 0.66Vp-p
PB 0.72Vp-p
REC 0.44Vp-p
REC 0.60Vp-p
PB 0.15Vp-p
REC 0.7Vp-p
REC 0.44Vp-p
REC 0.68Vp-p
Q22 2SC1740S(RS)
Q102 2SA854S(QR)
IC2
TP32 BIAS-
TP31 BIAS+
R9 BIAS ADJ
TP33 ERASE
T1
T2
TP34 FULL ERASE
CN5 REC/PB
AE HEAD
REC 50Vp-p
CN6 FE HEAD
PB 80mVp-p
TP53 PB FM
IC1 AN3380NK
PB 0.45Vp-p
MODE CTL
AMP
AGC AMP
TRACK AMP
SW1
SW2
SW3
SW4
SW5
SW6
CH1
CH2
PB ON
SYNC
Q101 2SD1468S(RS)
Q12, Q13 DTC143TS
BPF 1
BPF 2
Q3 DTC114ES
CN7
CH1
CH2
To 28 SW/DISPLAY CN11 CN10 (Page 3-26)
IND(L)
IND(R)
From 03 REGULATOR (MAIN) CN802 (Page 3-12) CN1
UNSW 12V
GND
SWD 5V
TP GND
CP1 ICP-F10
To 03 SERVO (MAIN) CN15 CN501 (Page 3-18)
GND
AUDIO FM
HR-S5000EG AUDIO(BLUE)
A
B
C
D
E
F
G
H
1
2
3
4
5

3.23 AUDIO CIRCUIT BOARD


R74
IND(R)
R73
IND(L)
R9
BIAS ADJ
R40
EE LEVEL(L)
R41
EE LEVEL(R)
PB20390A-01
AUDIO PWB ASS'Y
PB20390
-01-0
AUDIO-PWB
TP33 BIAS(-)
TP31 BIAS(+)
TP GND
TP39 PB FM
A.ERASE
F.ERASE
BIAS ADJ
1
2
3
4
5
A
B
C
D
E
F
G
H

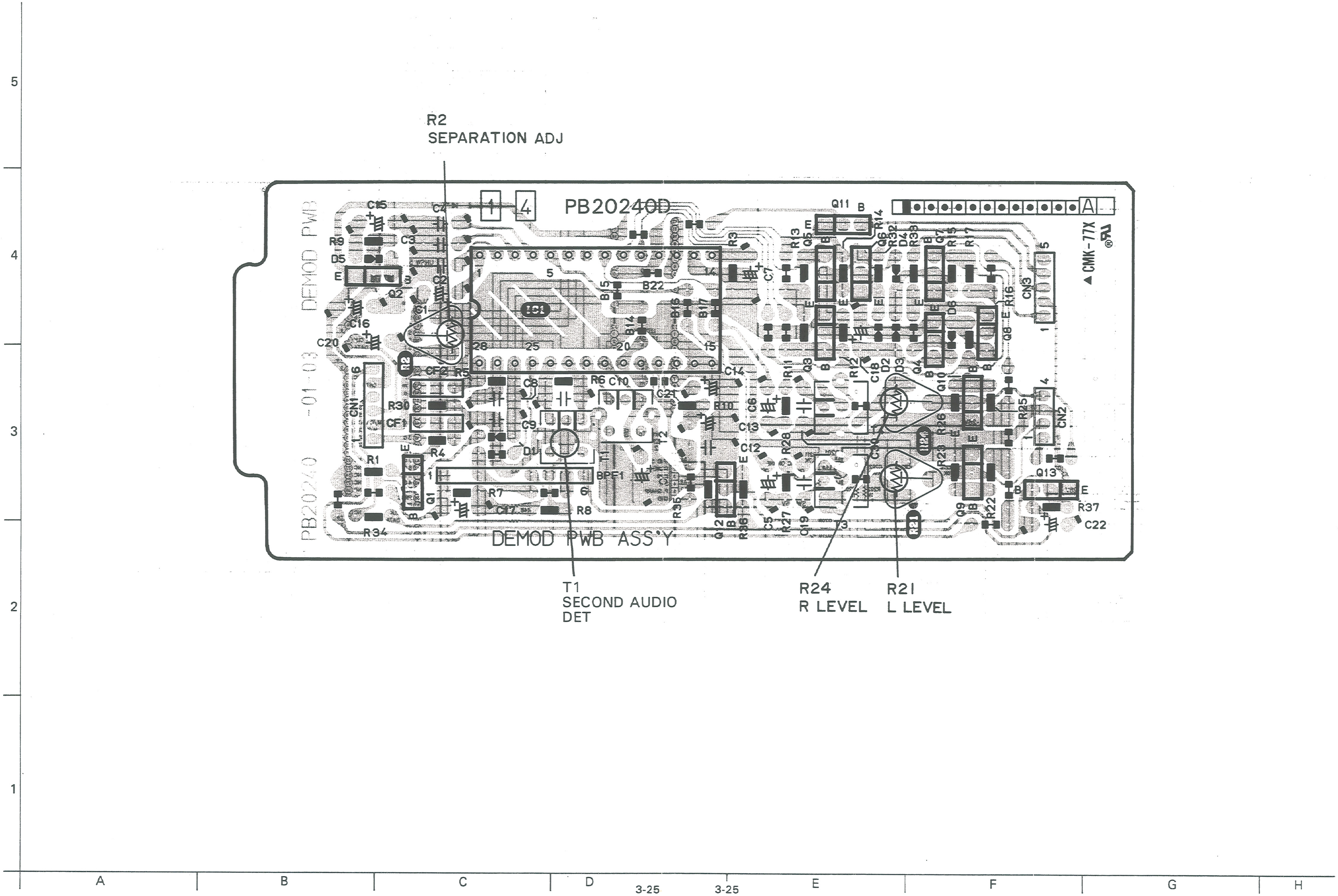
3.24 DEMODULATOR SCHEMATIC DIAGRAM



14 DEMODULATOR
From/To 08
TUNER CTL
CN3 (Page3-20)
CN1
SIF
GND
AUDIO
MUTE
SWD 12V
Q1
DTC114ES
R2
SEPARATION ADJ
IC1
TDA3800GS
Q11
DTA144ES
Q3~Q8
DTC114ES
C20 10/16
R2 10K
C1 10/16
C2 0.0039
C3 0.0039
C4 0.0039
C5 10/16
C6 10/16
R3 15K
C7 47/16
R1 10K
L1
R1
L2
R2
OUTPUT SW
CONTROL LOGIC
MATRIX
IC1
COMP
SIF AMP
FM DET
PILOT AMP
PILOT DET
Vcc
GND
D1
C8 0.022
R4 330
R5 820
C9 0.047
R6 1K
C10 0.001
R10 27K
C11 470/16
C12 0.047
C13 10/16
C14 10/16
CF1 5.74MHz
CF2 5.74MHz
T1 5.74MHz SOUND AUDIO
T2 54.7KHz DET BUZZ
SWD 12V
R11 10K
R12 10K
R13 10K
R14 10K
R15 10K
R16 10K
R17 10K
Q4
D3
D6
Q8
Q3
D2
C18 47/16
D4
Q7
Q6
Q5
To 28
SW/DISPLAY
CN7 (Page3-26)
CN3
BILING CTL
BILING CTL
BILING LED
STEREO LED
FORCED MONO
To 09
AUDIO
CN8 (Page3-22)
CN2
BILINGUAL CTL
L (MAIN)
GND
R (SUB)
R21
AUDIO L LEVEL
R21 3.3K
R22 2.2K
R23 10K
Q9
R24
AUDIO R LEVEL
R24 3.3K
R25 2.2K
R26 10K
Q10
Q2
SWD 12V
R9 270
D5
C15 33/16
C16 100/16
BPF 1
BPF 274.1Hz
BPF 117.5Hz
Vcc
CEXT
GND
C17 1/50
R7 100K
R8 150K
R34 100K
R36 390K
R37 10K
Q13
Q12
R35 220K
C22 22/16
Q2
2SD1292 (QR)
Q12,Q13
2SC1740S (RS)
Q9,Q10
2SD1450S. T
5
4
3
2
1
A
B
C
D
E
F
G
H

NOTE: Voltages are DC-measured with a digital voltmeter during stop and tuner mode.

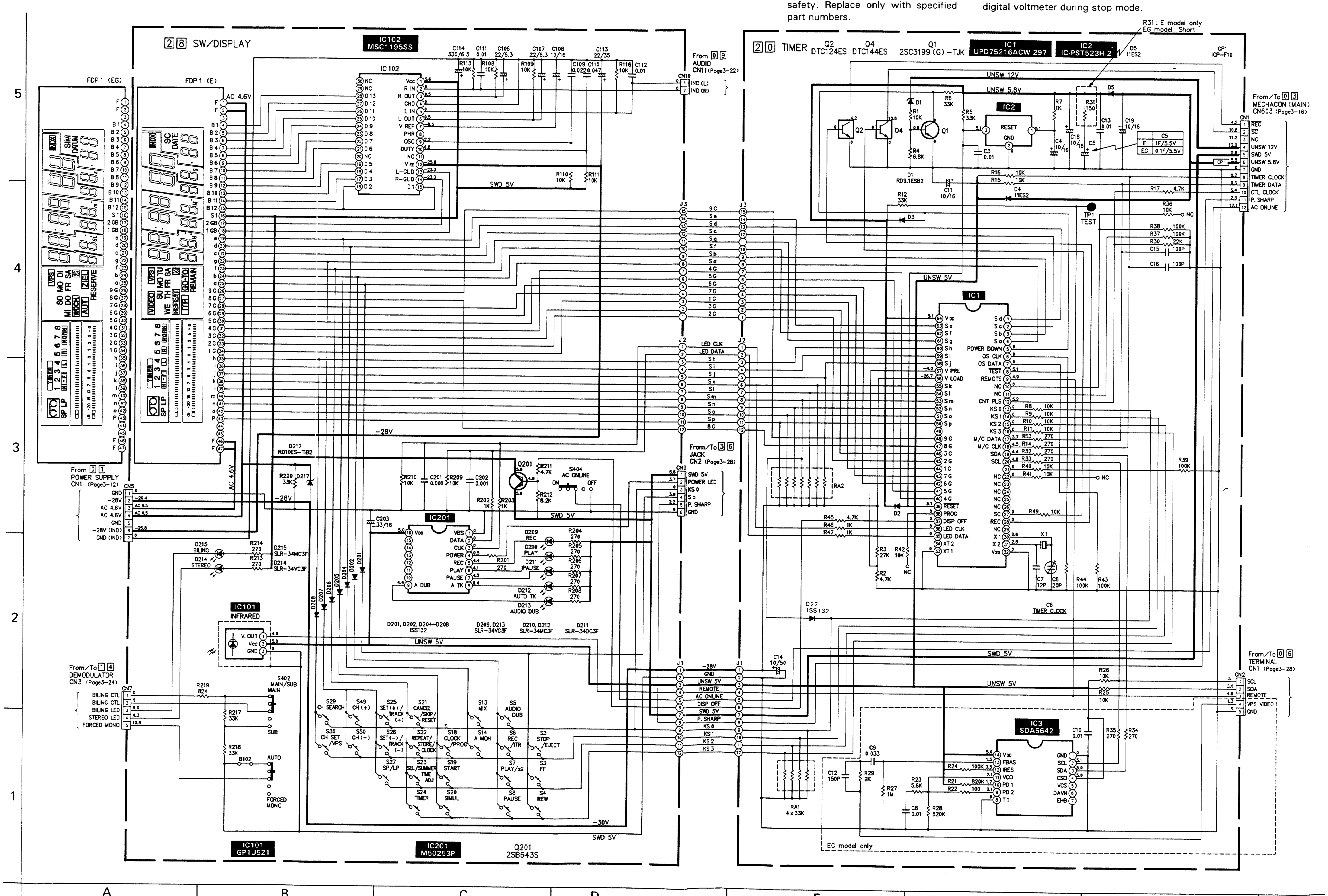
3.25 DEMODULATOR CIRCUIT BOARD


R2
SEPARATION ADJ
PB20240D
DEMOD PWB
PB20240 -01-03
DEMOD PWB ASS'Y
CMK-77X
IC1
CN1
CN2
CN3
T1
SECOND AUDIO
DET
R24
R LEVEL
R21
L LEVEL
5
4
3
2
1
A
B
C
D
E
F
G
H

3.26 TIMER AND SWITCH/DISPLAY SCHEMATIC DIAGRAMS

NOTES:

1. Shaded (▨) parts are critical for safety. Replace only with specified part numbers.
2. Voltages are DC-measured with a digital voltmeter during stop mode.

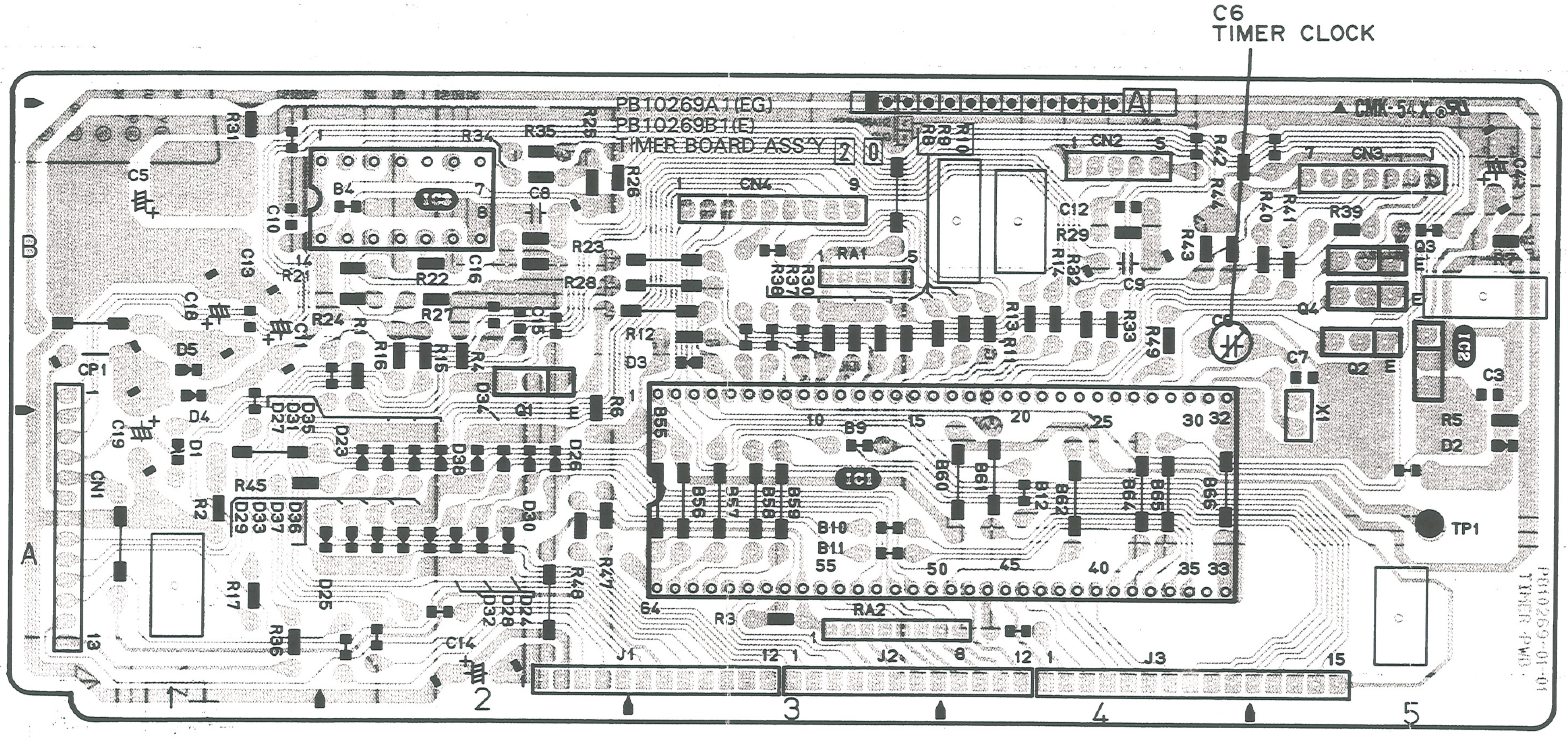


R31 : E model only
EG model : Short
28 SW/DISPLAY
IC102 MSC1195SS
20 TIMER
Q2 DTC124ES
Q4 DTC144ES
Q1 2SC3199 (G) -TJK
IC1 UPD75216ACW-297
IC2 IC-PST523H-2
D5 11ES2
CP1 ICP-F10
FDP1 (EG)
FDP1 (E)
From 09 AUDIO CN11 (Page3-22)
From/To 03 MECHACON (MAIN) CN603 (Page3-16)
REC
SC
NC
UNSW 12V
SWD 5V
UNSW 5.8V
GND
TIMER CLOCK
TIMER DATA
CTL CLOCK
P. SHARP
AC ONLINE
From/To 36 JACK CN2 (Page3-28)
SWD 5V
POWER LED
KS 0
So
P. SHARP
GND
From 01 POWER SUPPLY CN1 (Page3-12)
GND
-28V
AC 4.6V
AC 4.6V
GND
-28V (IND)
GND (IND)
From/To 14 DEMODULATOR CN3 (Page3-24)
BILING CTL
BILING CTL
BILING LED
STEREO LED
FORCED MONO
From/To 06 TERMINAL CN1 (Page3-28)
SCL
SDA
REMOTE
VPS VIDEO
GND
IC101 INFRARED
IC201
IC3 SDA5642
S404 AC ONLINE
S402 MAIN/SUB
S29 CH SEARCH
S49 CH (+)
S25 SET(+)/TRACK(+)
S21 CANCEL/SKIP/RESET
S13 MIX
S5 AUDIO DUB
S30 CH SET/VPS
S50 CH (-)
S26 SET(-)/TRACK(-)
S22 REPEAT/STORE/CLOCK
S18 CLOCK/PROG
S14 A MON
S6 REC/ITR
S2 STOP/EJECT
S27 SP/LP
S23 SEL/SUMMER TIME ADJ
S19 START
S7 PLAY/x2
S3 FF
S24 TIMER
S20 SIMUL
S8 PAUSE
S4 REW
D201, D202, D204–D208 1SS132
D209, D213 SLR-34VC3F
D210, D212 SLR-34MC3F
D211 SLR-34OC3F
D215 SLR-34MC3F
D214 SLR-34VC3F
D217 RD10ES-TIB2
D27 1SS132
RA1 4×33K
X1
C6 TIMER CLOCK
TP1 TEST
EG model only
IC101 GP1U521
IC201 M50253P
Q201 2SB643S
UNSW 5V
SWD 5V
-28V
-30V
1
2
3
4
5

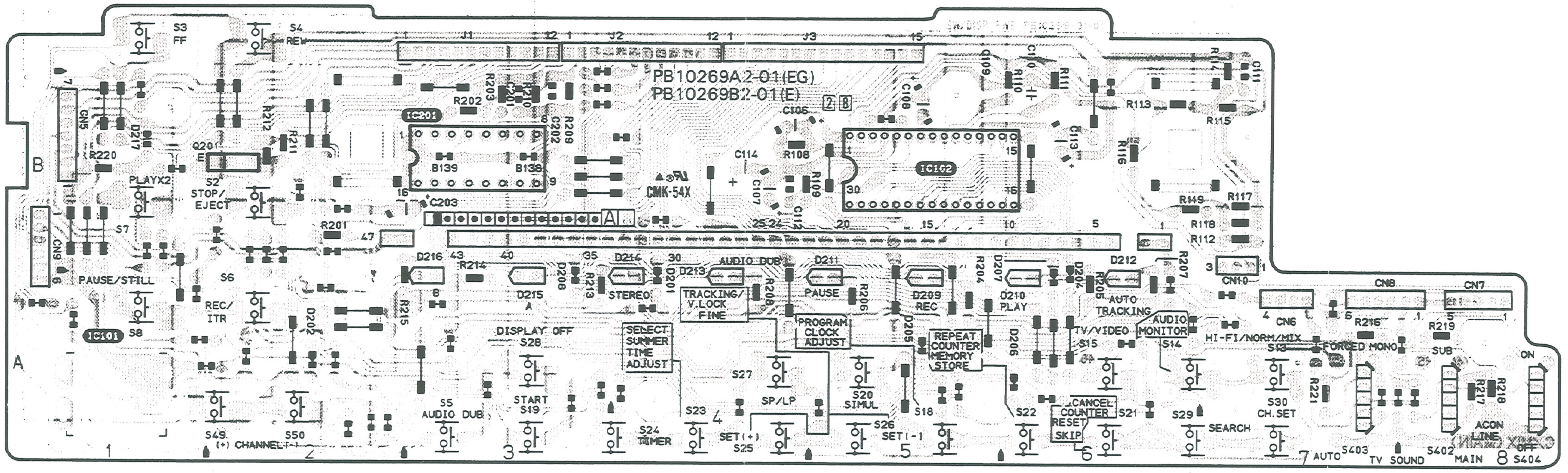
A
B
C
D
E
F
G
H

3.27 TIMER AND SWITCH/DISPLAY CIRCUIT BOARDS

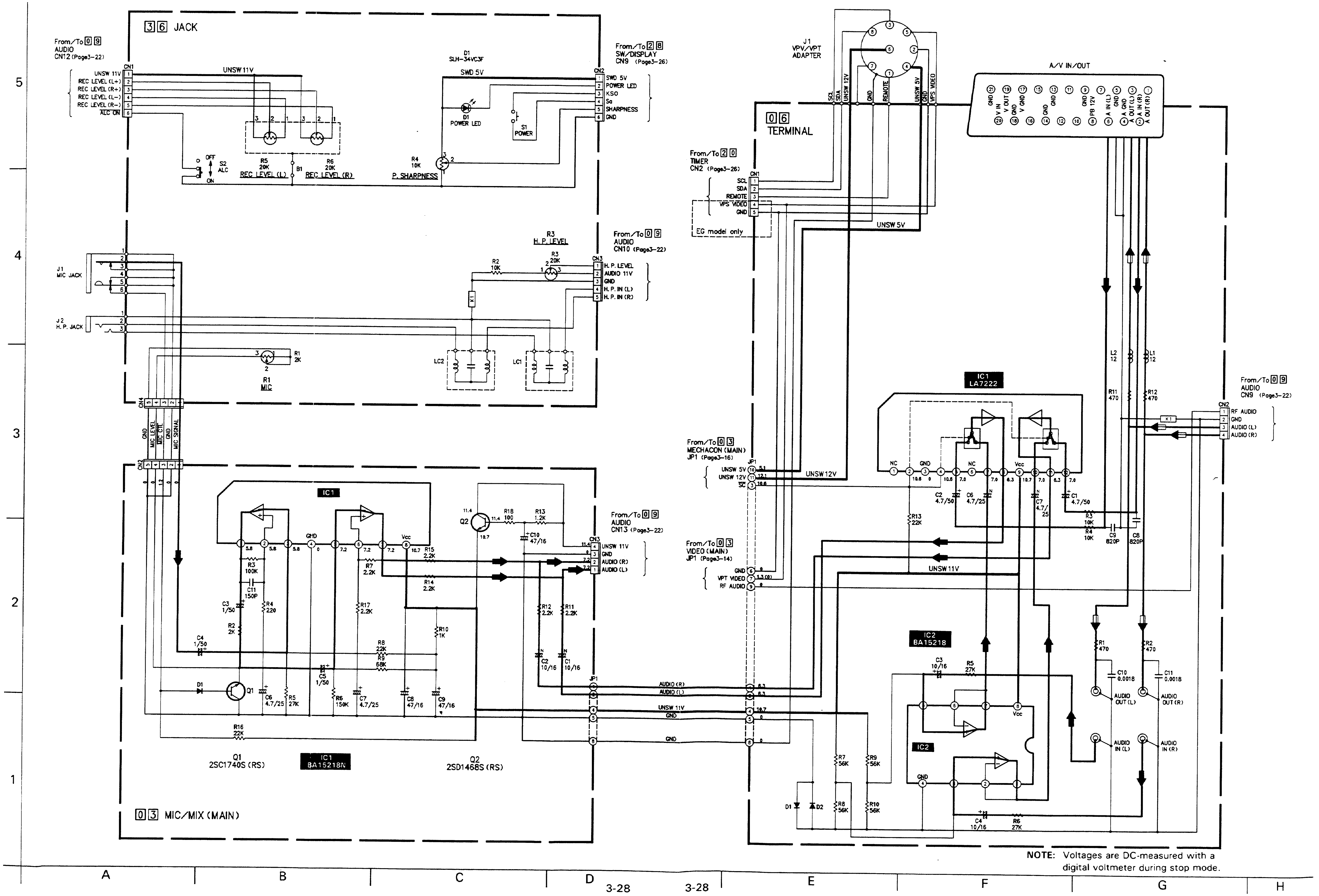
—TIMER—


C6
TIMER CLOCK
PB10269A1(EG)
PB10269B1(E)
TIMER BOARD ASS'Y
CMK-54X
CN1
CN2
CN3
CN4
CP1
IC1
IC2
IC3
RA1
RA2
J1
J2
J3
X1
TP1
Q1
Q2
Q3
Q4
A
B
1
2
3
4
5

—SWITCH/DISPLAY—


PB10269A2-01(EG)
PB10269B2-01(E)
CMK-54X
IC101
IC102
IC201
J1
J2
J3
S3 FF
S4 REW
PLAYX2
S2 STOP/EJECT
S7
PAUSE/STILL
S6
REC/ITR
S8
S49 (+) CHANNEL (-) S50
S5 AUDIO DUB
DISPLAY OFF S28
START S19
SELECT SUMMER TIME ADJUST
S24 TIMER
S23
SET(+) S25
S27
SP/LP
S20 SIMUL
S26 SET(-)
S18
STEREO
AUDIO DUB
TRACKING/V.LOCK FINE
PAUSE
PROGRAM CLOCK ADJUST
REC
PLAY
REPEAT COUNTER MEMORY STORE
S22
CANCEL COUNTER RESET SKIP
S21
AUTO TRACKING
TV/VIDEO S15
AUDIO MONITOR S14
S29 SEARCH
S30 CH.SET
HI-FI/NORM/MIX
S13
FORCED MONO
SUB
AUTO S403
TV SOUND
S402
MAIN
ACON LINE
OFF S404
ON
CN6
CN7
CN8
CN9
CN10
CN5
A
B
1
2
3
4
5
6
7
8

3.28 MIC/MIX (MAIN), TERMINAL AND JACK SCHEMATIC DIAGRAMS

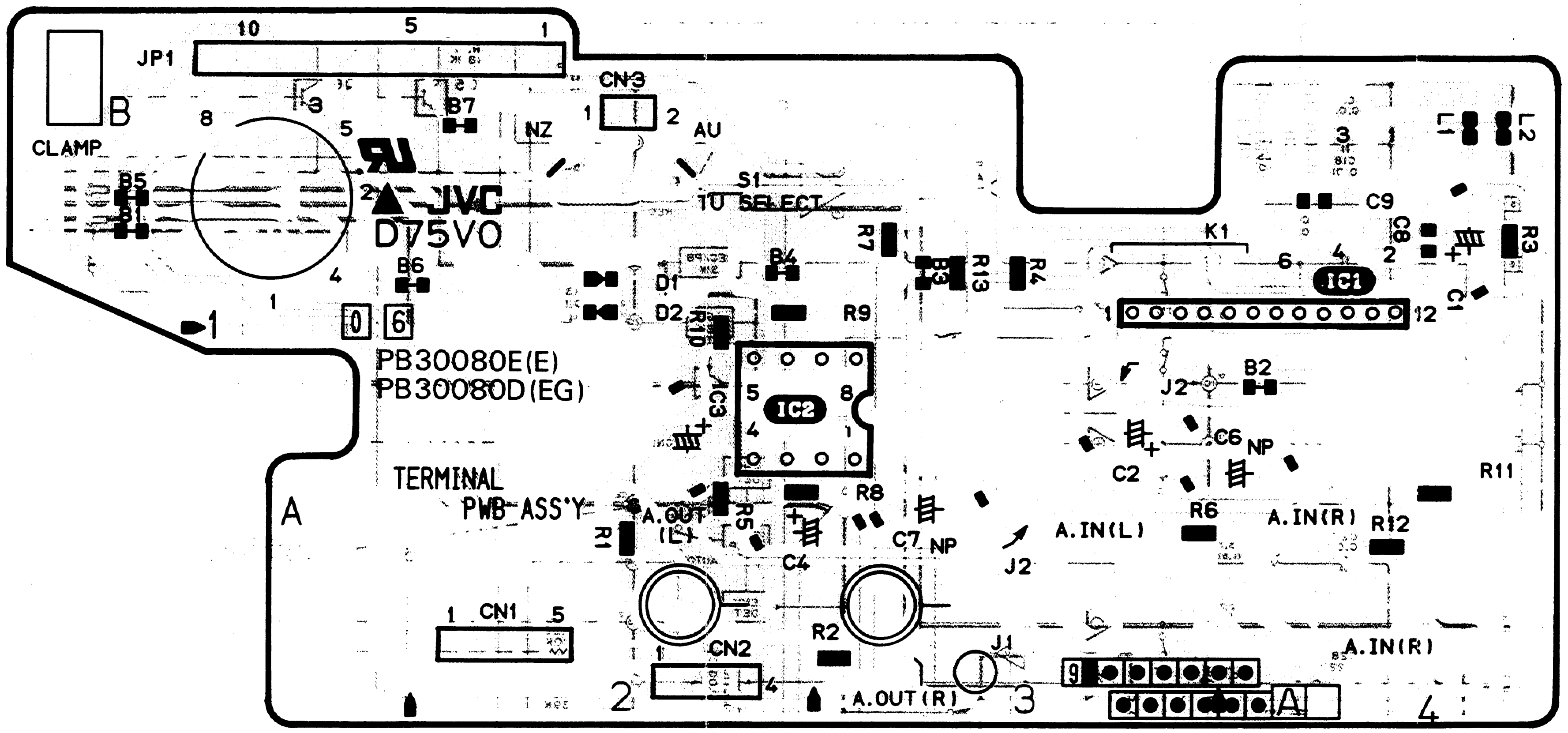


36 JACK
From/To 09 AUDIO CN12 (Page3-22)
UNSW 11V
REC LEVEL (L+)
REC LEVEL (R+)
REC LEVEL (L-)
REC LEVEL (R-)
ALC ON
CN1
D1 SLH-34VC3F
SWD 5V
D1 POWER LED
S1 POWER
From/To 28 SW/DISPLAY CN9 (Page3-26)
CN2
SWD 5V
POWER LED
KSO
Sa
SHARPNESS
GND
S2 ALC
OFF
ON
R5 20K REC LEVEL (L)
B1
R6 20K REC LEVEL (R)
R4 10K P. SHARPNESS
J1 MIC JACK
J2 H. P. JACK
R3 H. P. LEVEL
R3 20K
R2 10K
K1
From/To 09 AUDIO CN10 (Page3-22)
CN3
H. P. LEVEL
AUDIO 11V
GND
H. P. IN (L)
H. P. IN (R)
LC2
LC1
R1 2K
R1 MIC
CN4
GND
MIC LEVEL
MIC CTL
GND
MIC SIGNAL
CN2
IC1
GND
Vcc
Q2
R18 100
R13 1.2K
C10 47/16
R3 100K
C11 150P
C3 1/50
R4 220
R2 2K
R7 2.2K
R15 2.2K
R14 2.2K
R17 2.2K
R10 1K
R12 2.2K
R11 2.2K
C2 10/16
C1 10/16
C4 1/50
R8 22K
R9 68K
C5 1/50
D1
Q1
C6 4.7/25
R5 27K
R6 150K
C7 4.7/25
C8 47/16
C9 47/16
R16 22K
From/To 09 AUDIO CN13 (Page3-22)
UNSW 11V
GND
AUDIO (R)
AUDIO (L)
JP1
AUDIO (R)
AUDIO (L)
UNSW 11V
GND
GND
Q1 2SC1740S (RS)
IC1 BA15218N
Q2 2SD1468S (RS)
03 MIC/MIX (MAIN)
J1 VPV/VPT ADAPTER
SCL
SDA
UNSW 12V
GND
REMOTE
UNSW 5V
GND
VPS VIDEO
06 TERMINAL
From/To 20 TIMER CN2 (Page3-26)
CN1
SCL
SDA
REMOTE
VPS VIDEO
GND
EG model only
UNSW 5V
A/V IN/OUT
GND
V IN
V OUT
GND
V GND
GND
GND
PB 12V
A IN (L)
GND
A OUT (L)
A IN (R)
A OUT (R)
From/To 03 MECHACON (MAIN) JP1 (Page3-16)
UNSW 5V
UNSW 12V
SC
UNSW 12V
From/To 03 VIDEO (MAIN) JP1 (Page3-14)
GND
VPT VIDEO
RF AUDIO
IC1 LA7222
NC
GND
NC
Vcc
C2 4.7/50
C6 4.7/25
C7 4.7/25
C1 4.7/50
R13 22K
R3 10K
R4 10K
C9 820P
C8 820P
UNSW 11V
L2 12
L1 12
R11 470
R12 470
From/To 09 AUDIO CN9 (Page3-22)
CN2
RF AUDIO
GND
AUDIO (L)
AUDIO (R)
K1
IC2 BA15218
C3 10/16
R5 27K
Vcc
IC2
GND
R7 56K
R9 56K
R8 56K
R10 56K
D1
D2
C4 10/16
R6 27K
R1 470
R2 470
C10 0.0018
C11 0.0018
AUDIO OUT (L)
AUDIO OUT (R)
AUDIO IN (L)
AUDIO IN (R)
1
2
3
4
5
A
B
C
D
E
F
G
H

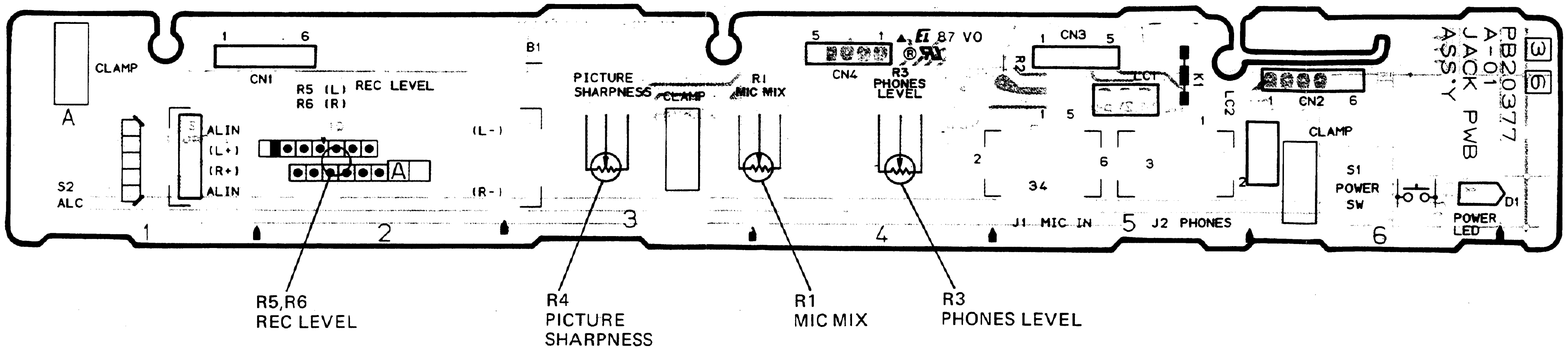
NOTE: Voltages are DC-measured with a digital voltmeter during stop mode.

3.29 TERMINAL AND JACK CIRCUIT BOARDS

—TERMINAL—


JP1
10
5
1
CN3
CLAMP
B
B5
B1
B7
B6
NZ
AU
S1
10 SELECT
JVC
D75VO
D1
D2
R7
R10
B4
B3
R13
R4
R9
K1
IC1
12
C9
C8
C1
L2
R3
PB30080E(E)
PB30080D(EG)
IC2
C3
TERMINAL
PWB ASS'Y
A.OUT (L)
R1
R5
R8
C4
C7 NP
J2
B2
C6 NP
C2
R6
A.IN(L)
A.IN(R)
R11
R12
CN1
CN2
R2
J1
A.OUT(R)
A.IN(R)
A

—JACK—


CLAMP
A
CN1
R5 (L) REC LEVEL
R6 (R)
B1
S2
ALC
ALIN
(L+)
(R+)
ALIN
(L-)
(R-)
PICTURE SHARPNESS
CLAMP
R1
MIC MIX
CN4
87 VO
R3
PHONES LEVEL
CN3
R2
LC1
K1
LC2
CN2
CLAMP
S1
POWER SW
D1
POWER LED
J1 MIC IN
J2 PHONES
PB20377
A-01
JACK PWB
ASS'Y
36

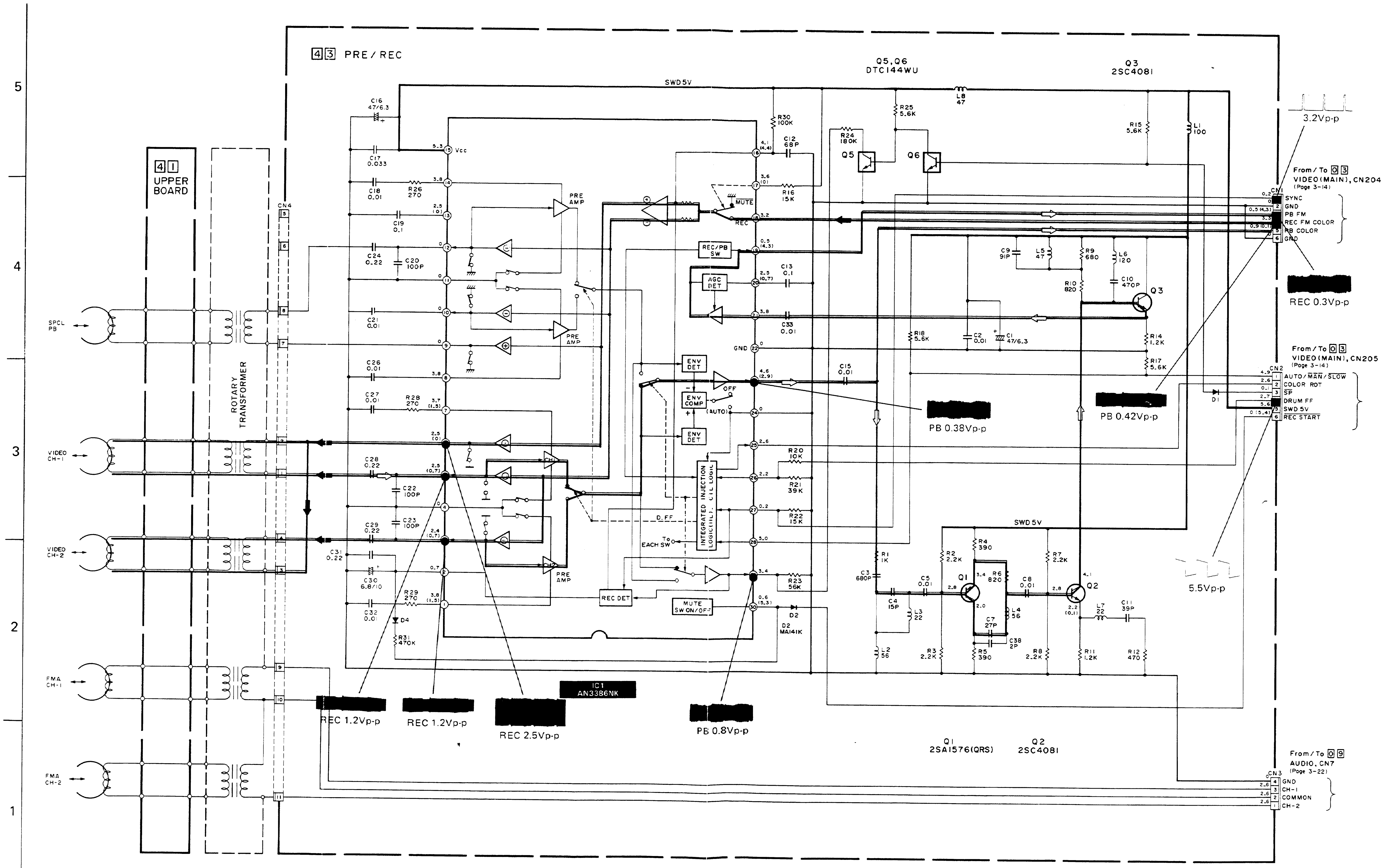
R5,R6
REC LEVEL

R4
PICTURE
SHARPNESS

R1
MIC MIX

R3
PHONES LEVEL

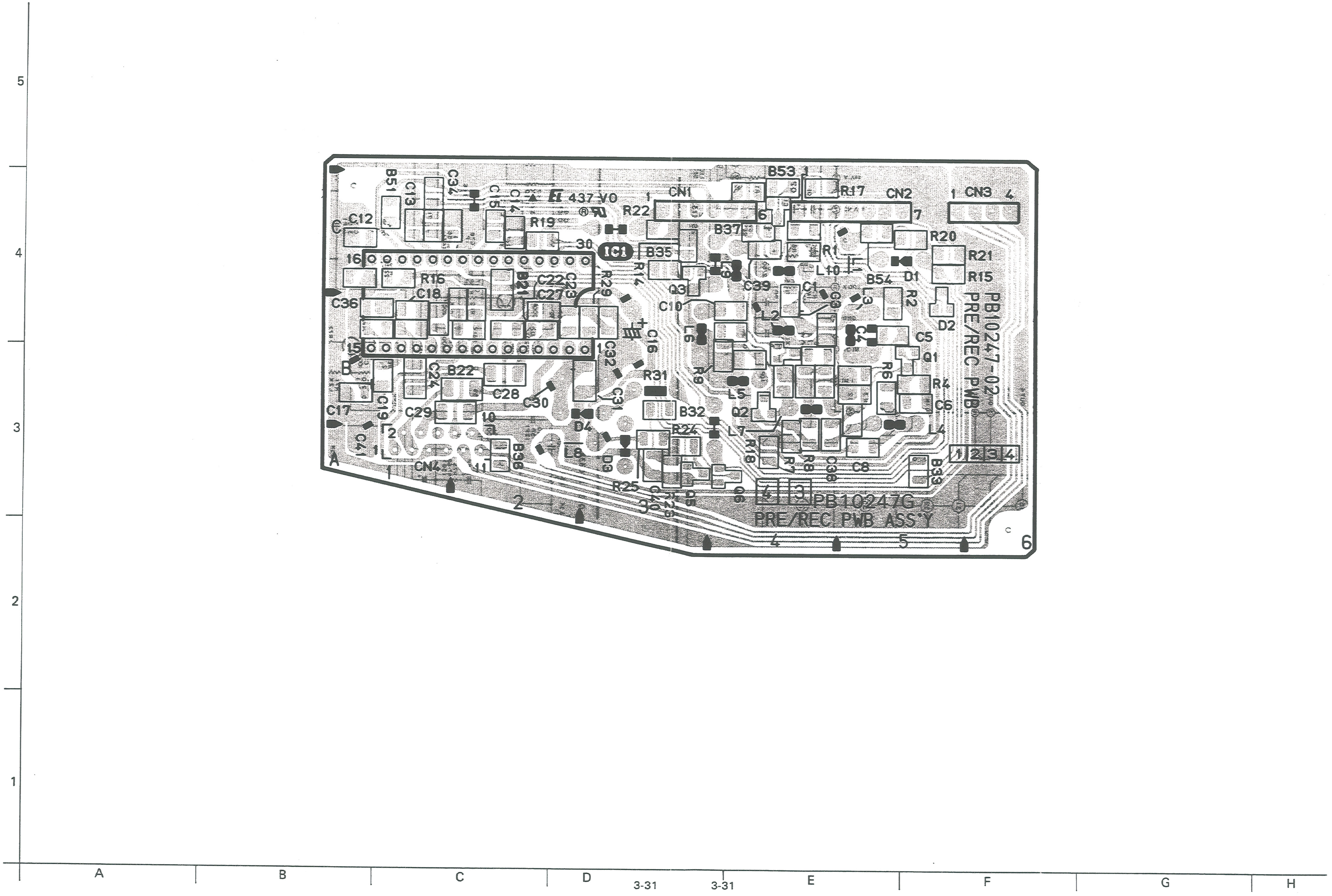
3.30 PRE/REC SCHEMATIC DIAGRAM



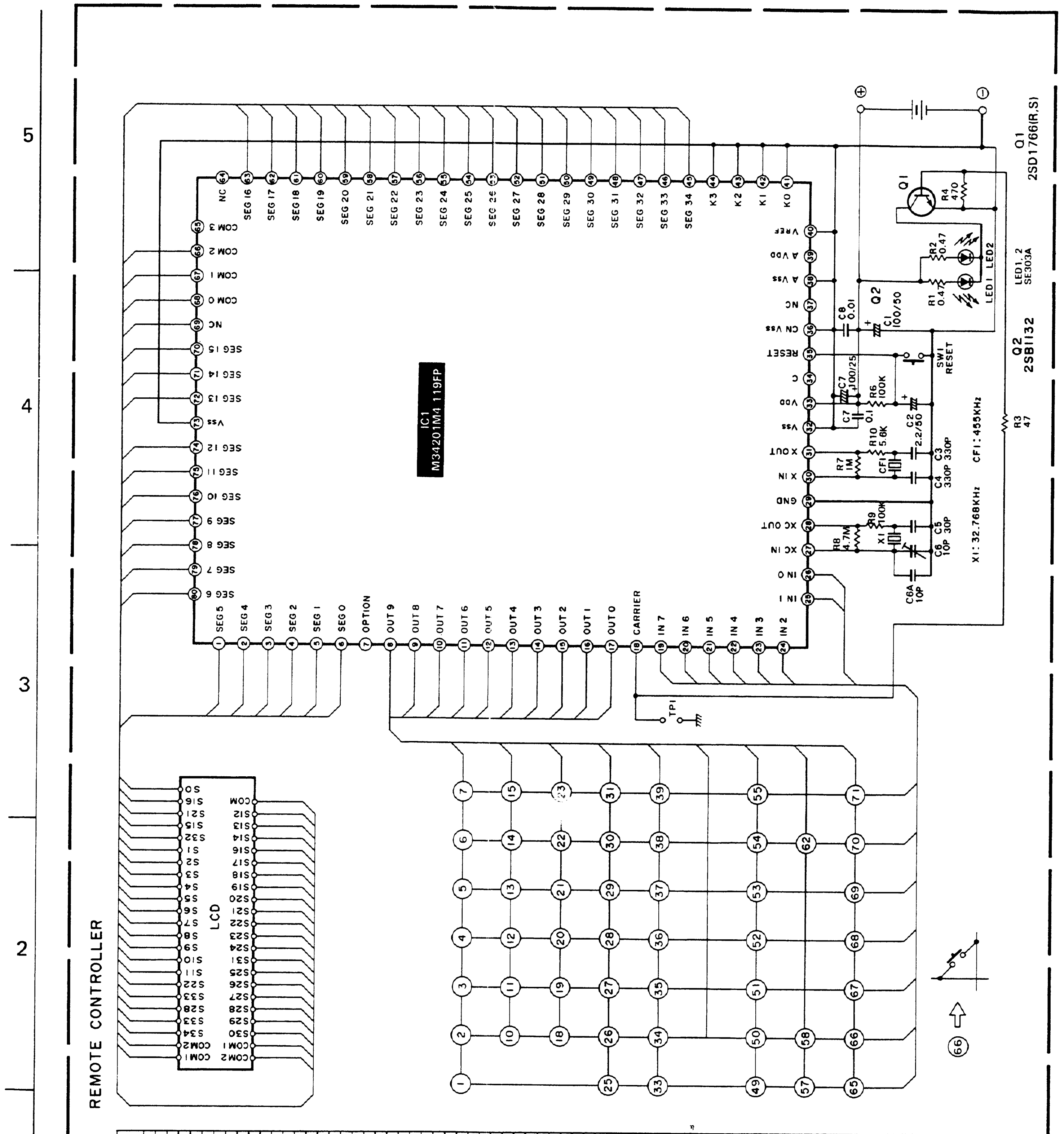
43 PRE / REC
41 UPPER BOARD
ROTARY TRANSFORMER
SPCL PB
VIDEO CH-1
VIDEO CH-2
FMA CH-1
FMA CH-2
CN4
SWD 5V
Q5, Q6 DTC144WU
Q3 2SC4081
IC1 AN3386NK
Q1 2SA1576(QRS)
Q2 2SC4081
PRE AMP
REC/PB SW
AGC DET
ENV DET
ENV COMP
(AUTO)
OFF
MUTE
REC
INTEGRATED INJECTION LOGIC(I²L) . CTL LOGIC
D.FF
To EACH SW
REC DET
MUTE SW ON/OFF
Vcc
GND
C16 47/6.3
C17 0.033
C18 0.01
R26 270
C19 0.1
C24 0.22
C20 100P
C21 0.01
C26 0.01
C27 0.01
R28 270
C28 0.22
C22 100P
C29 0.22
C23 100P
C31 0.22
C30 6.8/10
R29 270
C32 0.01
D4
R31 470K
R30 100K
C12 68P
R16 15K
C13 0.1
C33 0.01
C15 0.01
R20 10K
R21 39K
R22 15K
R23 56K
D2 MA141K
R24 180K
R25 5.6K
L8 47
R15 5.6K
L1 100
C9 91P
L5 47
R9 680
L6 120
C10 470P
R10 820
R18 5.6K
C2 0.01
C1 47/6.3
R14 1.2K
R17 5.6K
D1
R1 1K
C3 680P
C4 15P
L3 22
L2 56
R2 2.2K
R3 2.2K
R4 390
R5 390
R6 820
C5 0.01
C7 27P
C38 2P
L4 56
C8 0.01
R7 2.2K
R8 2.2K
R11 1.2K
L7 22
C11 39P
R12 470
3.2Vp-p
REC 0.3Vp-p
PB 0.38Vp-p
PB 0.42Vp-p
5.5Vp-p
REC 1.2Vp-p
REC 1.2Vp-p
REC 2.5Vp-p
PB 0.8Vp-p
From / To 03 VIDEO (MAIN), CN204 (Page 3-14)
CN1
SYNC
GND
PB FM
REC FM COLOR
PB COLOR
GND
From / To 03 VIDEO (MAIN), CN205 (Page 3-14)
CN2
AUTO / MAN / SLOW
COLOR ROT
SP
DRUM FF
SWD 5V
REC START
From / To 09 AUDIO, CN7 (Page 3-22)
CN3
GND
CH-1
COMMON
CH-2
5
4
3
2
1
A
B
C
D
E
F
G
H

NOTE: Shaded ( ) parts are critical for safety. Replace only with specified part numbers.

3.31 PRE/REC CIRCUIT BOARD


PB10247G
PRE/REC PWB ASS'Y
PB10247-02
PRE/REC PWB
IC1
CN1
CN2
CN3
CN4
B51
B53
B54
B35
B37
B21
B22
B32
B33
B36
C12
C13
C34
C15
C14
C36
C18
C22
C23
C27
C28
C29
C30
C24
C17
C19
C41
C16
C32
C31
C39
C10
C1
C5
C6
C8
C38
C40
R16
R19
R22
R14
R29
R31
R24
R25
R17
R1
R2
R20
R21
R15
R4
R6
R7
R8
R9
R18
L10
L2
L4
L5
L6
L7
L8
D1
D2
D3
D4
Q1
Q2
Q3
Q5
Q6
437 V0
1
2
3
4
5
6
A
B
C
D
E
F
G
H

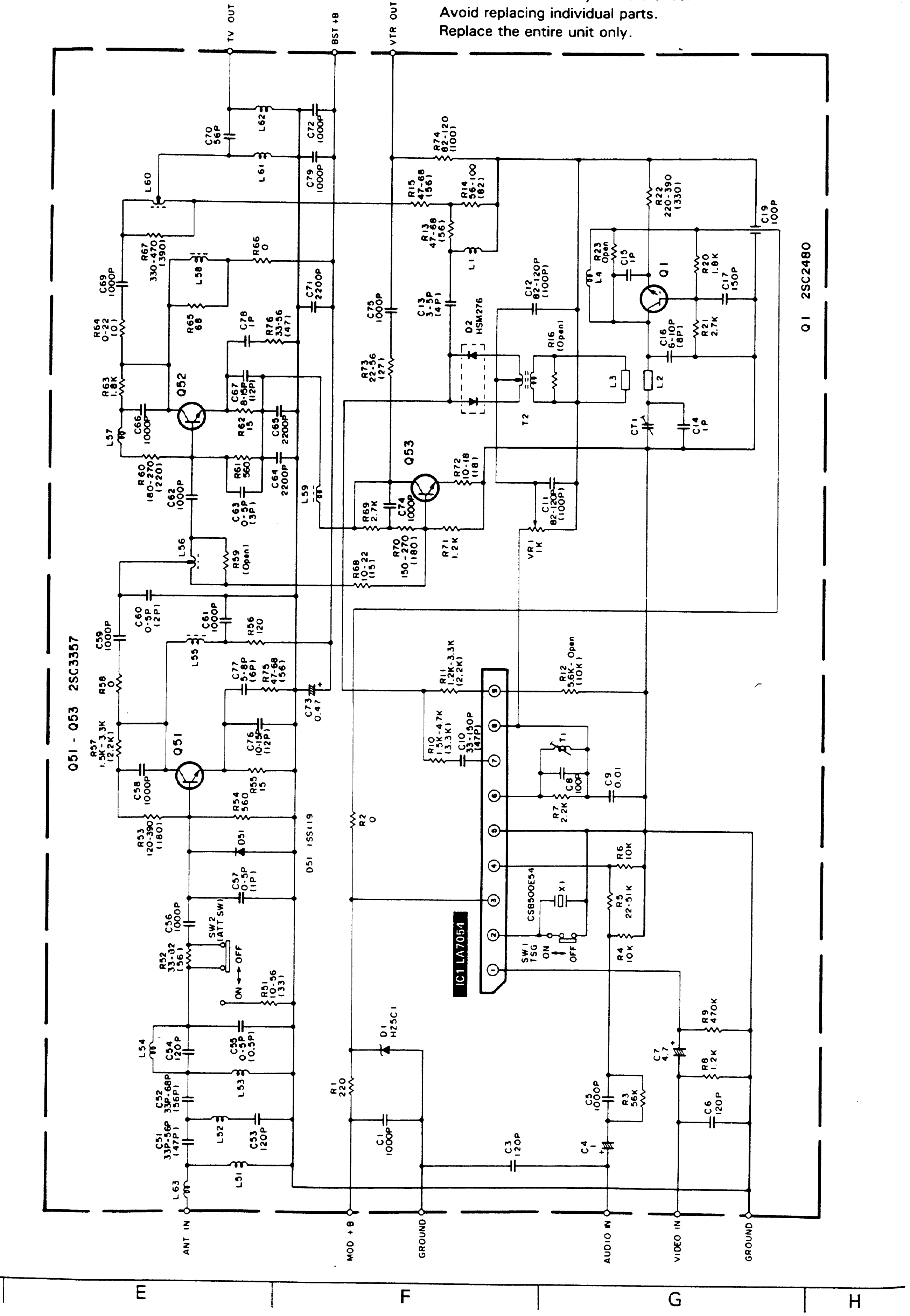
3.32 REMOTE CONTROL SCHEMATIC DIAGRAM


REMOTE CONTROLLER
IC1 M34201M4 119FP
Q1 2SD1766(R,S)
Q2 2SB1132
LED1,2 SE303A
LED1 LED2
SW1 RESET
CF1: 455KHz
X1: 32.768KHz
LCD
TP1
C1 100/50
C2 2.2/50
C3 330P
C4 330P
C5 30P
C6 10P
C6A 10P
C7 0.1
C7 100/25
C8 0.01
R1 0.47
R2 0.47
R3 47
R4 470
R6 100K
R7 1M
R8 4.7M
R9 100K
R10 5.6K
SEG 0
SEG 1
SEG 2
SEG 3
SEG 4
SEG 5
OPTION
OUT 0
OUT 1
OUT 2
OUT 3
OUT 4
OUT 5
OUT 6
OUT 7
OUT 8
OUT 9
CARRIER
IN 2
IN 3
IN 4
IN 5
IN 6
IN 7
K0
K1
K2
K3
VREF
A VDD
A VSS
NC
CN VSS
RESET
C
VDD
VSS
X OUT
X IN
GND
XC OUT
XC IN
IN 0
IN 1
COM 0
COM 1
COM 2
COM 3
5
4
3
2
1
A
B
C
D

KEY NUMBER	FUNCTION
1	A/B CODE
2	CLOCK ADJ
3	1
4	6
5	C. RESET
6	MARK
7	EDIT MODE
8	
9	
10	MEMORY PROGRAM
11	2
12	7
13	DISPLAY
14	START
15	STANDBY
16	
17	
18	MEMORY CANCEL
19	3
20	6
21	VPS
22	INDEX
24	ERASE
25	TRANSFER
26	PROGRAM
27	4
28	9
29	CURSOR BACK
30	GO-TO
31	
32	
33	TIMER
34	CANCEL
35	5
36	O/AUX
37	CURSOR NEXT
38	INTORUCTION
39	AUDIO MONITOR
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	STOP
50	EJECT
51	FF
52	REW
53	REC
54	PLAY
55	PAUSE
56	
57	SEARCH (–)
58	SEARCH (+)
59	
60	
61	
62	
63	
64	
65	MONITOR (TV/VIDEO)
66	OPERATE
67	TV CH (–)
68	TV CH (+)
69	TV VOL (+)
70	TV VOL (–)
71	TV OPERATE

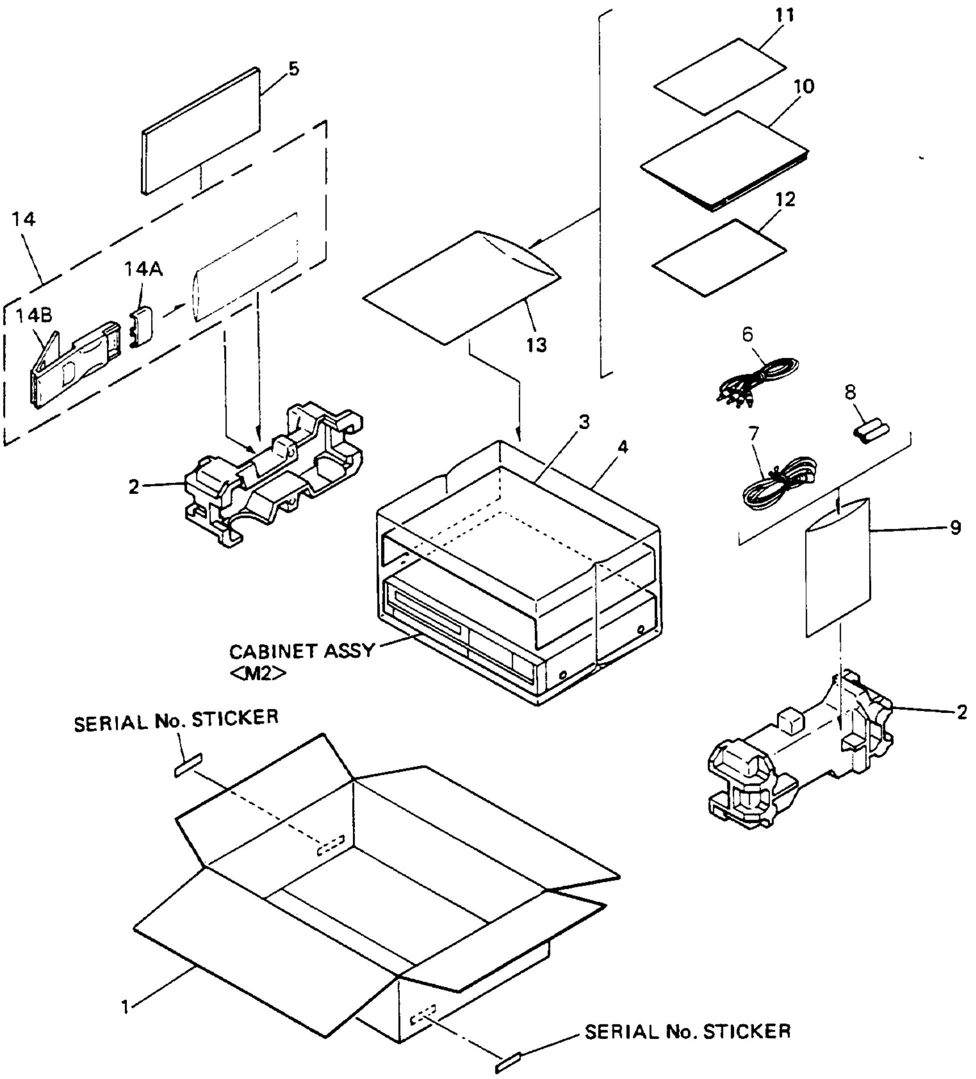
3.33 RF CONVERTER SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.


TV OUT
BST +B
VTR OUT
ANT IN
MOD +B
GROUND
AUDIO IN
VIDEO IN
GROUND
Q1 2SC2480
Q51 - Q53 2SC3357
IC1 LA7054
D1 HZ5C1
D51 1SS119
D2 HSM276
X1 CSB500E54
SW1 TSG ON OFF
SW2 ATT SW
ON ←→ OFF
T1
T2
CT1
VR1 1K
E
F
G
H

SECTION 4
EXPLODED VIEWS AND PARTS LIST

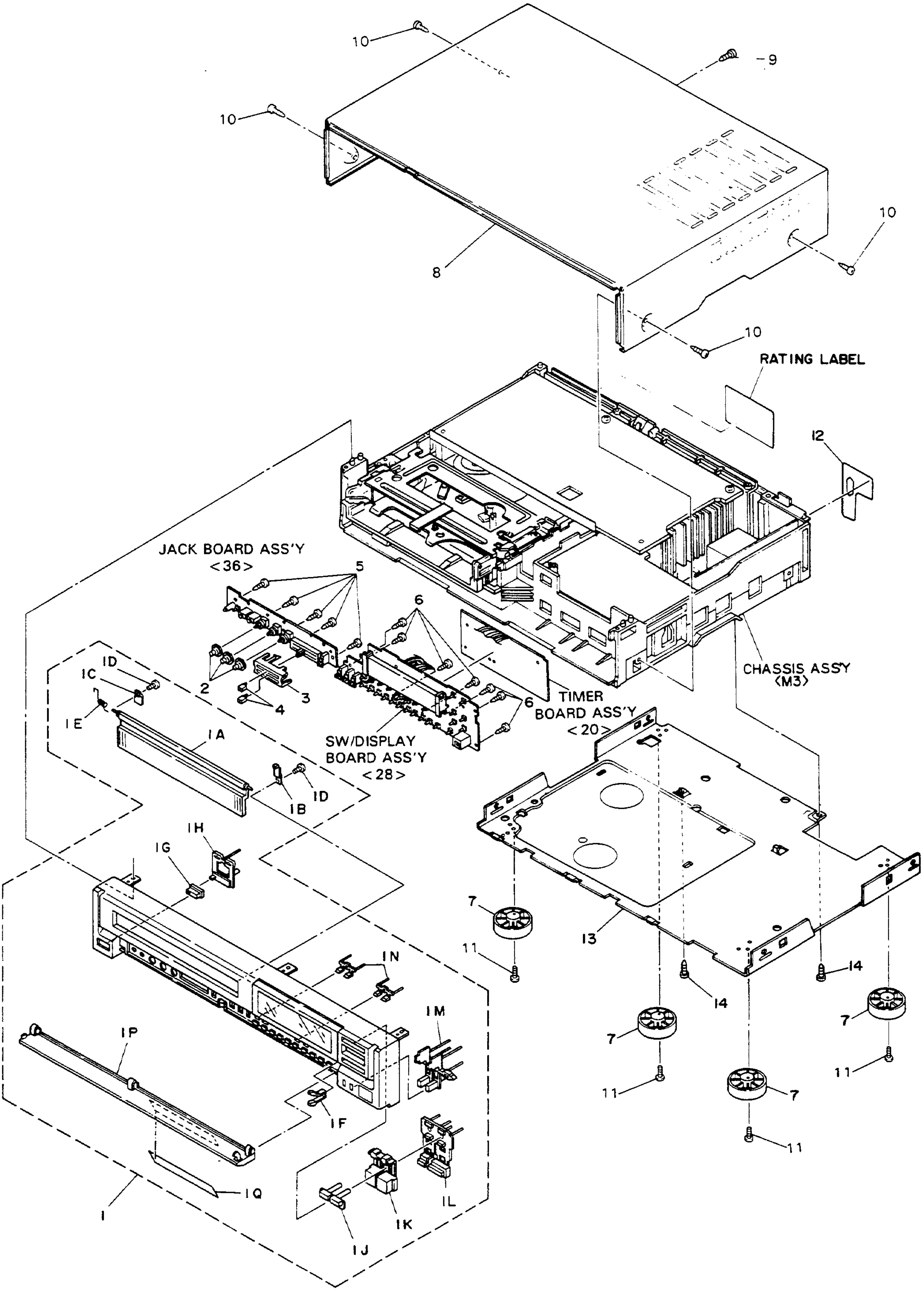
4.1 PACKING ASSEMBLY <M1>


11
10
12
5
14
14A
14B
13
6
8
7
3
4
2
9
CABINET ASSY <M2>
SERIAL No. STICKER
2
1
SERIAL No. STICKER

PACKING ASSEMBLY <M1>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ32790-59-12	PACKING CASE,EG
		PQ32790-72	PACKING CASE,E
	2	PQ32817A-3	CUSHION ASSY
	3	PQ41026-20	PROTECT SHEET
	4	PQM30021-59-11	POLY BAG
	5	PQ42987-6	SHEET
	6	PU56142-3	PIN CORD ASSY
		or PU56142-5	PIN CORD ASSY
	7	PU59168-3	RF CABLE
		or PU59167-3	RF CABLE
	8	UM-3DJ2P	BATTERY
	9	QPGA020-02003	POLY BAG
⚠	10	PU30425-1059	INSTRUCTIONS,EG
⚠		PU30425-1067	INSTRUCTIONS,E
	11	TCN-3379	TAPE CATALOG
	12	BT-20114	WARRANTY CARD,EG
	13	QPGA025-03505	POLY BAG
⚠	14	PQ10779R	REMOTE CONTROLLER,E
⚠		PQ10779K	REMOTE CONTROLLER,EG
	14A	PQ32715	BATTERY CAP
	14B	PQ32901B	DOOR ASSY,EG
		PQ32901D	DOOR ASSY,E

4.2 CABINET ASSEMBLY <M2>


10
9
10
8
10
10
RATING LABEL
12
JACK BOARD ASS'Y
<36>
5
6
2
3
4
1D
1C
1E
1A
1B
1D
SW/DISPLAY
BOARD ASS'Y
<28>
TIMER
BOARD ASS'Y
<20>
6
CHASSIS ASS'Y
(M3)
1H
1G
1N
1M
1P
1F
1Q
1
1J
1K
1L
7
11
13
14
14
7
11
7
11
7
11

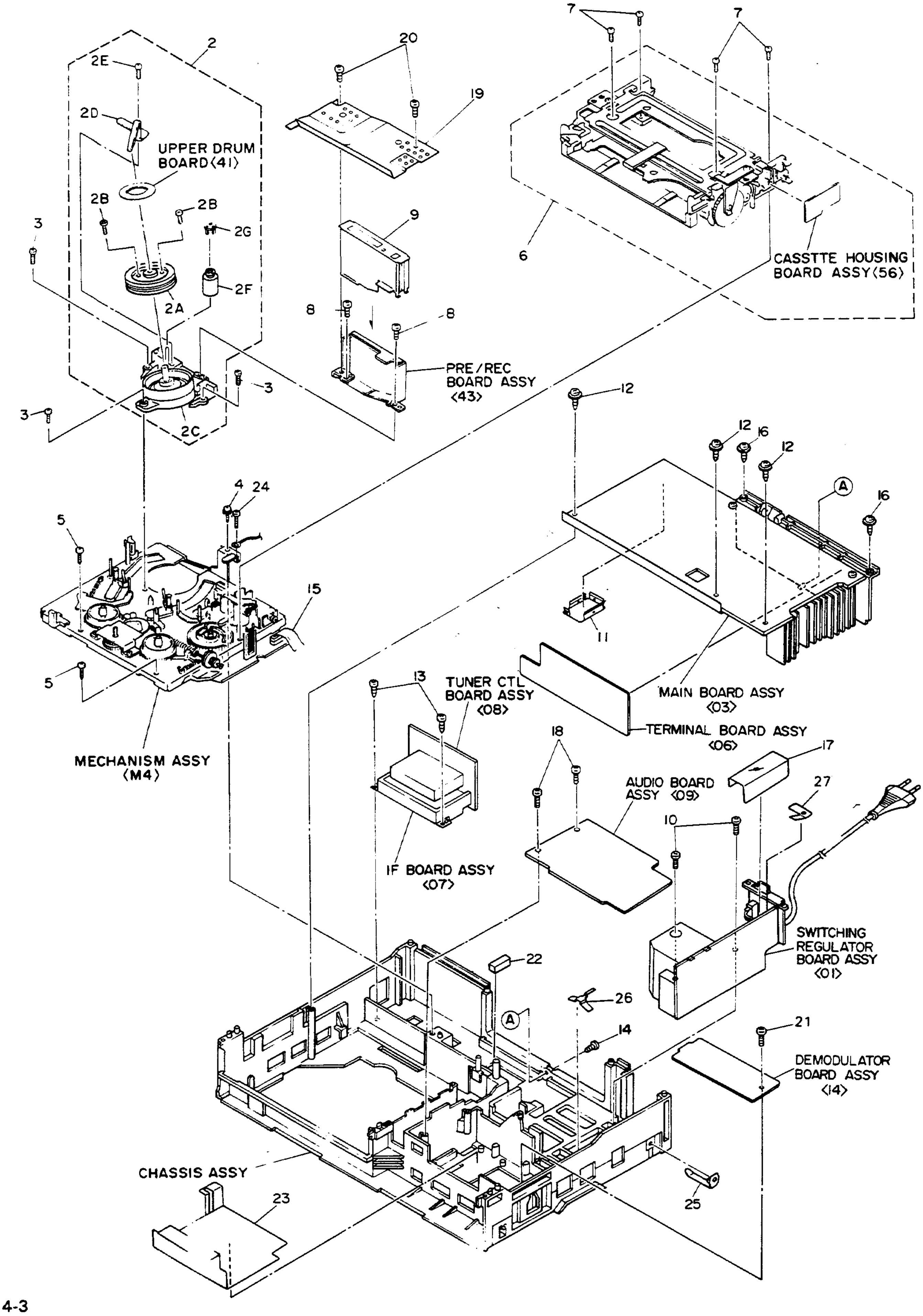
CABINET ASSEMBLY <M2>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ10837A-1	FRONT PANEL ASSY,EG
		PQ10837B-2	FRONT PANEL ASSY,E
	1A	PQ20811-1-1	CASSETTE DOOR,EG
		PQ20811-2-1	CASSETTE DOOR,E
	1B	PQ43371	BRACKET 1
	1C	PQ43736	BRACKET(4)
	1D	SDSF2006Z	SCREW,X2
	1E	PQ43628-1-1	TORSION SPRING
	1F	PU60005	PUSH OPEN UNIT
	1G	PQ32617-7	BUTTON(POWER),E
		PQ32617-4	BUTTON(POWER),EG
	1H	PQ43730	INDICATOR(POWER)
	1J	PQ32842	BUTTON(FF)
	1K	PQ32843	BUTTON(PLAY)
	1L	PQ20813	BUTTON(PAUSE),EG
		PQ20813-2	BUTTON(PAUSE),E
	1M	PQ32844	BUTTON(CH)
	1N	PQ43898	BUTTON(PROG)
	1P	PQ32845A-1	DOOR ASSY,(INCL.1Q)
		PQ32845B-1	DOOR ASSY,(INCL.1Q)
	1Q	PQ43964-2	STICKER
	2	PQ43932	KNOB,X3
	3	PQ32145	SLIDE HOLDER
	4	PQ43253	SLIDE KNOB,X2
	5	SDSF2608Z	SCREW,X5
	6	SDSF2608Z	SCREW,X7
	7	PQ43456A	FOOT ASSY,X4
⚠	8	PQ10602-7	TOP COVER
	9	SDSF3010M	SCREW
	10	PQ43827	SPECIAL SCREW,X4
	11	SDSF3012Z	SCREW, X4
⚠	12	PQ32942	SHEET(OUTLET)
⚠		PQ32942-2	SHEET(OUTLET)
⚠	13	PQ10712-1-3	BOTTOM COVER
	14	SDSF3008Z	SCREW,X2, FOR BOTTOM COVER

CHASSIS ASSEMBLY <M3>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	2	PDV2175A	DRUM ASSY
	2A	PDM2112B	UPPER DRUM ASSY
	2B	PDM4165A	DRUM SCREW ASSY, X2
	2C	PDM2108J	LOWER DRUM MOTOR ASSY
	2D	PDM4181A-3	BRUSH ASSY
	2E	SDST2606Z	TAPPING SCREW
	2F	PDM4187A	I.D.ROLLER ASSY
	2G	PQ41163	CAP
	3	SPST2610Z	SCREW,X3, DRUM
	4	PQ43831	SPECIAL SCREW, MAIN DECK
	5	PQ43831	SPECIAL SCREW,X2, MAIN DECK
	6	PUS29183B-6	CASSETTE HOUSING ASSY
	7	SDST2608Z	SCREW,X4, C.HOUSING
	8	SDST2606Z	SCREW,X2, PRE/REC
	9	PQ32217-1-1	SHIELD CASE(2), PRE/REC
	10	PQ43831	SPECIAL SCREW,X2, P.TRANS
	11	PQ42582	PRE AMP SHIELD2, MAIN BOARD
	12	GPSF2610Z	SCREW,X3, MAIN BOARD
	13	SDSF3008Z	SCREW,X2, TUNER UNIT
	14	SDSF3010M	SCREW, TERM BOARD
	15	PW30601-14450	PARALLEL WIRE
	16	GPSF2610Z	SCREW,X2, TERM BOARD
⚠	17	PQ44070	AC COVER
	18	SDSF2610Z	SCREW,X2, AUDIO BOARD
	19	PQ32387-1-4	DRUM SHIELD
	20	SDST2608Z	SCREW,X2, D.SHIELD
	21	SDSF2610Z	SCREW, DEMOD
	22	PQM30029-127	SPACER, CHASSIS
	23	PQ32981A	SHILD PLATE ASSY, AUDIO BOAR
	24	SPST2606Z	SCREW(AUDIO GND)
	25	PQ43278	EARTH PLATE
	26	PQ43942	EARTH PLATE
	27	PQ44295	AC COVER

4.3 CHASSIS ASSEMBLY <M3>



2
2E
2D
UPPER DRUM BOARD〈41〉
2B
2B
2G
3
2A
2F
3
3
2C
20
19
9
8
8
PRE/REC BOARD ASSY 〈43〉
7
7
6
CASSTTE HOUSING BOARD ASSY〈56〉
12
12
16
12
A
16
4
24
5
15
5
MECHANISM ASSY 〈M4〉
11
MAIN BOARD ASSY 〈03〉
TERMINAL BOARD ASSY 〈06〉
13
TUNER CTL BOARD ASSY 〈08〉
IF BOARD ASSY 〈07〉
18
AUDIO BOARD ASSY 〈09〉
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SWITCHING REGULATOR BOARD ASSY 〈01〉
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DEMODULATOR BOARD ASSY 〈14〉
CHASSIS ASSY
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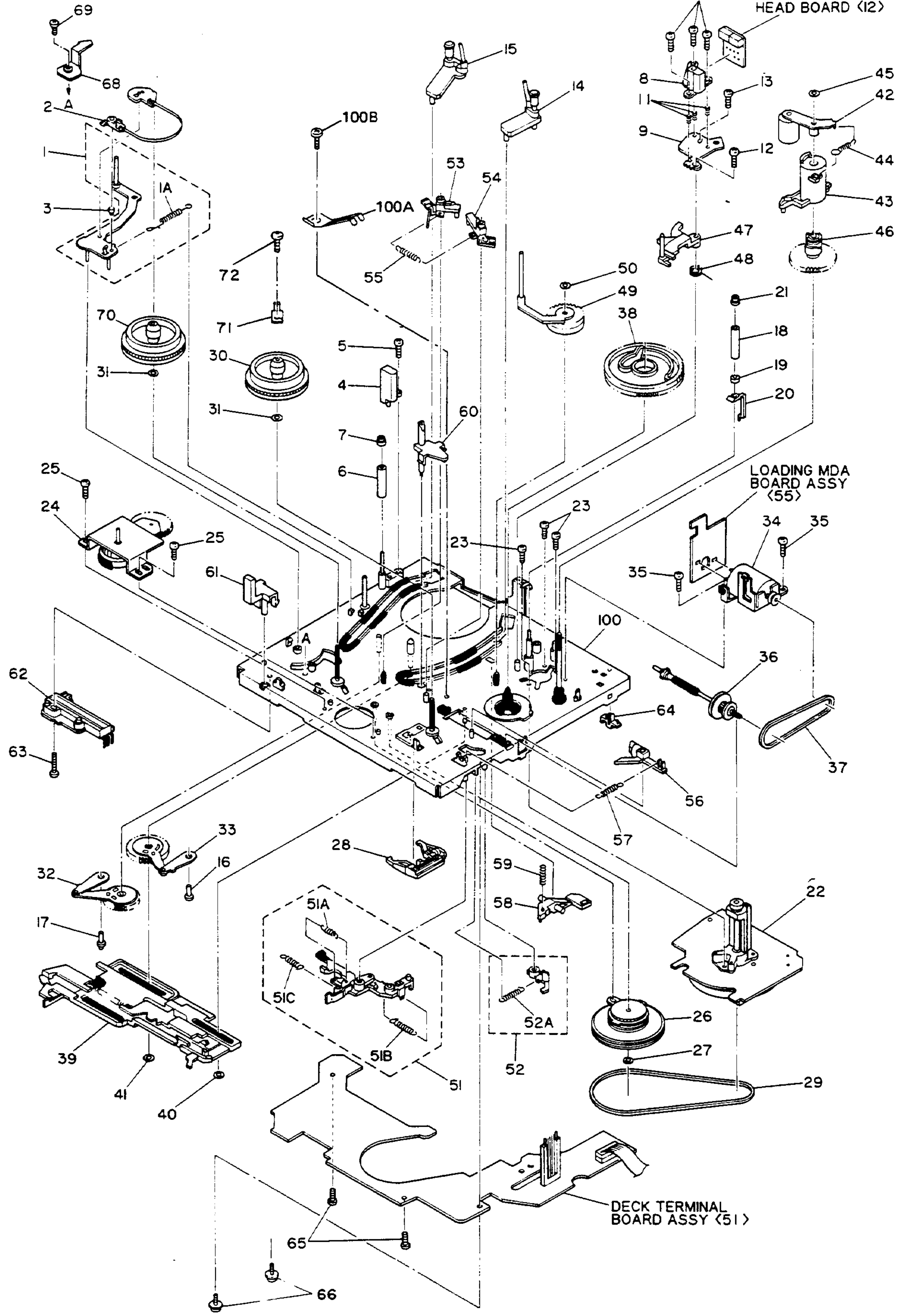
4.4 MECHANISM ASSEMBLY <M4>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AUDIO/CONTROL HEAD BOARD ‹12›
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LOADING MDA BOARD ASSY ‹55›
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DECK TERMINAL BOARD ASSY ‹51›
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Category	Part number	MARK
Grease	KANTO-G-31KAV	■
Oil	COSMO-HV56	▨

NOTE: The section marked in red and blue indicate lubrication and greasing areas.

MECHANISM ASSEMBLY <M4>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ43497A	TENSION ARM ASSY
	1A	PQ43500	TENSION SPRING
	2	PQ43501A-7	TENSION BAND ASSY
	3	PQ43503-1-4	ADJUST PIN
	4	PU60616	FULL ERASE HEAD
	5	SDSF2614Z	TAPPING SCREW
	6	PQ43505-1-1	ROLLER
	7	PQ43506	GUIDE POLE CAP
	8	PU60617	AUDIO/CONTROL HEAD
	9	PQ43509	HEAD BASE
	10	SPSP2608Z	SCREW, X3
	11	PQM30002-192	COMPRESSION SPRING, X3
	12	SPSP2606Z	SCREW
	13	SPSF2608M	TAPPING SCREW
	14	PU61103	POLE BASE ASSY(TAKE-UP)
	15	PU61102	POLE BASE ASSY(SUPPLY)
	16	PQ43524	STOPPER
	17	PQ43525	STOPPER 2
	18	PQ43526	TAPE GUIDE
	19	PQ43670-1-1	GUIDE FLANGE
	20	PQ43675	TAPE GUARD
	21	PQ43506	GUIDE POLE CAP
⚠	22	PU60892	CAPSTAN MOTOR
	23	SPSG2608Z	TAPPING SCREW, X3
	24	PU60618-1-2	IDLER GEAR UNIT
	25	SPST2606Z	SCREW, X2
	26	PU60953-1-1	CLUTCH UNIT
	27	PQM30017-8	SLIT WASHER
	28	PQ43532A-1	CHANGE LEVER ASSY
	29	PQM30003-24	BELT
	30	PU60858	REEL DISK(TAKE-UP)
	31	PQM30018-54	SPACER, X2
	32	PQ43537A	LOADING ARM ASSY (SUPPLY)
	33	PQ43542B	LOADING ARM ASSY(TAKE-UP)
⚠	34	PQ43676B	MODE MOTOR ASSY
⚠		or PU60628-3	LOADING MOTOR
	35	SPST2606Z	TAPPING SCREW, X2
	36	PQ43548A-2	WORM CLUTCH ASSY
	37	PQM30003-23	BELT(LOADING)
	38	PQ32413	CONTROL CAM
	39	PQ43555B	PLATE ASSY
	40	PQM30017-12	SLIT WASHER
	41	PQM30017-8	SLIT WASHER
	42	PQ43558A	PINCH ROLLER ARM ASSY
	43	PQ32415	PINCH ROLLER PRESS LEVER
	44	PQM30001-233	TENSION SPRING
	45	PQM30017-12	SLIT WASHER
	46	PQ32416-1-1	PINCH ROLLER CAM
	47	PQ43567A-7	GUIDE ARM ASSY
	48	PQ43569-1-3	TORSION SPRING
	49	PQ43570A	HALF LOADING GEAR ASSY
	50	PQM30017-12	SLIT WASHER
	51	PQ43575A-2	CANCEL LEVER ASSY
	51A	PQM30001-236	TENSION SPRING
	51B	PQM30001-237	TENSION SPRING
	51C	PQM30001-239	TENSION SPRING
	52	PQ43578A-2	HOOK ASSY
	52A	PQM30001-238	TENSION SPRING
	53	PQ43581A-3	MAIN BRAKE ASSY(SUPPLY)
	54	PQ43582A	MAIN BRAKE ASSY(TAKE-UP)
	55	PQM30001-234	TENSION SPRING
	56	PQ43583A	SUB BRAKE ASSY(TAKE-UP)
	57	PQM30001-235	TENSION SPRING
	58	PQ43584A-4	CAPSTAN BRAKE ASSY
	59	PQM30002-193	COMPRESSION SPRING
	60	PU60621-1-1	LED HOLDER(INCL.LED:D1)
	61	PU60624-1-2	REC SAFETY SWITCH(S2)
	62	PU60622-1-1	SLIDE SWITCH, (S3)
	63	SDSF2614Z	TAPPING SCREW
	64	PQ32516	PWB HOLDER
	65	SDST2616Z	TAPPING SCREW, X2
	66	GPSF2608Z	TAPPING SCREW, X2
	68	PQ43999	T.BAND BKT-2
	69	SPST3004Z	SCREW
	70	PU60859	REEL DISK (SUPPLY)
	71	PQ43941	R.BRACKET
	72	SPST2606Z	SCREW, R.BRACKET
	100	PQ20650A-10	MAIN DECK ASS'Y
	100A	PQ43849	EARTH PLATE
	100B	SPST2604Z	SCREW

SECTION 5
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

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SWITCHING REGULATOR BOARD ASSY <01>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20389C-02	SW REGULATOR BOARD ASSY,E	
	PWBA	PB20389A-02	SW REGULATOR BOARD ASSY,EG	
	Q1	2SC4517A	TRANSISTOR	
	Q2	2SC3616(MLK)	TRANSISTOR	
	Q20	2SA1267(YG)-TJK	TRANSISTOR	
	Q21	2SC1740S	TRANSISTOR	
	Q22	2SA720	TRANSISTOR	
	D1	10E6-F2	DIODE	
	D2	10E6-F2	DIODE	
	D3	10E6-F2	DIODE	
	D4	10E6-F2	DIODE	
	D5	AU01	FR DIODE	
	D6	AG01	FR DIODE	
	D8	AU01Z	FR DIODE	
	D10	MTZ16BT-77	ZENER DIODE	
	D20	AU01Z	FR DIODE	
	D21	FML-12S	FR DIODE	
	D22	AU01Z	FR DIODE	
	D23	FMB-24	BARRIER DIODE	
	D24	MTZV6.2A	ZENER DIODE	
	D25	1SS133	DIODE	
	D27	MTZ30AT-77	ZENER DIODE	
	D28	MTZ13C	ZENER DIODE	
	R1	QRZ0078-2R2	W.W.RESISTOR	2.2
	R2	QRD161J-334	RESISTOR	330 K, 1/6W
	R3	QRD161J-334	RESISTOR	330 K, 1/6W
	R4	QRD161J-563	RESISTOR	56K, 1/6W
	R5	QRG029J-104G	OMF RESISTOR	100K, 2W
	R6	QRG029J-201G	OMF RESISTOR	200, 2W
	R7	QRD161J-102	RESISTOR	1.0K, 1/6W
	R8	QRD161J-102	RESISTOR	1.0K, 1/6W
	R9	QRX014J-R47	MF RESISTOR	0.47, 1W
	R20	QRD161J-222	RESISTOR	2.2K, 1/6W
⚠	R21	QRZ0077-470X	FUSIBLE RESISTOR	47
	R22	QRD161J-272	RESISTOR	2.7K, 1/6W
	R23	QRV144F-4320AY	CMF RESISTOR	432, 1/4W
	R24	QRV144F-4750AY	CMF RESISTOR	475, 1/4W
	R25	QRD161J-821	RESISTOR	820, 1/6W
	R26	QRD161J-331	RESISTOR	330, 1/6W
	R27	QRD161J-471	RESISTOR	470, 1/6W
⚠	C1	QFZ9022-333	MM CAPACITOR	0.033µF, 250V
⚠	C2	QFZ9022-223	MM CAPACITOR, E	0.022µF, 250V
⚠	C3	QFZ9022-223	MM CAPACITOR, EG	0.022µF, 250V
⚠	C4	QCZ9016-102K	CAPACITOR,E	0.001µF, 250V
⚠	C5	QCZ9016-102K	CAPACITOR,E	0.001µF, 250V
⚠	C6	QCZ9016-102K	CAPACITOR,EG	0.001µF, 250V
⚠	C7	QCZ9016-102K	CAPACITOR,EG	0.001µF, 250V
⚠	C8	QCZ9016-102K	CAPACITOR	0.001µF, 250V
⚠	C9	QCZ9016-102K	CAPACITOR	0.001µF, 250V
⚠	C10	QCZ9016-102K	CAPACITOR	0.001µF, 250V
⚠	C11	QCZ9016-102K	CAPACITOR	0.001µF, 250V
	C12	QEZ0147-107	E CAPACITOR	100µF, 400V
	C13	QCY53AK-472	CAPACITOR	0.0047µF, 1000V
	C14	QCY43AK-121	CAPACITOR	120pF, 1000V
	C15	QFV41HJ-124	TF CAPACITOR	0.12µF, 50V
	C16	QFL41HJ-472	MY CAP	0.0047µF, 50V
	C17	QETC1HM-105	E CAPACITOR	1.0µF, 50V
	C20	QETC1JM-476	E CAPACITOR	47µF, 63V
	C21	QEMB1CM-158	E CAPACITOR	1500 µF, 16V
	C22	QETC1JM-476	E CAPACITOR	47µF, 63V
	C23	QEZ0136-228	E CAPACITOR	2200µF
	or	QEZ0106-228	E CAPACITOR	2200µF
	C25	QETC1VM-336	E CAPACITOR	33µF, 35V
	C26	QETC1VM-226	E CAPACITOR	22µF, 35V
	C27	QFV41HJ-103	TF CAPACITOR	0.01µF, 50V
	C28	QFL41HJ-103	MY CAP	0.01µF, 50V
	C29	QFV41HJ-104	TF CAPACITOR	0.1µF, 50V
	C30	QFL41HJ-103	MY CAP	0.01µF, 50V
	C31	QCZ9016-102K	CAPACITOR,E	0.001µF, 250V
	C32	QCZ9016-102K	CAPACITOR,E	0.001µF, 250V
	C33	QCZ9016-102K	CAPACITOR,E	0.001µF, 250V
	L20	PU60943-330K	COIL	33µH
	L21	PU60943-330K	COIL	33µH
	L22	PU48530-150K	COIL	15µH
⚠	PHS1	PC111S	PHOTO COUPLER	
⚠	POC1	QMP3980-200	POWER CORD	
⚠	RY1	PU59457	RELAY	
⚠	T1	PU61119	SWITCHING TRANSFORMER	
⚠	AO1	QMC9021-001	AC OUTLET	
⚠	BKT1	PQ32166-5	TRANS BRACKET	
⚠	HD1	PU57505	FUSE CLIP,X4	
⚠		QHS3771-108	STRAIN RELIEF	
	HS1	PU61117	HEAT SHINK (1)	
	HS2	PU61118	HEAT SHINK (2)	
⚠	LF1	PU61108	LINE FILTER	
⚠	LF2	PU59707	LINE FILTER,EG	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	SCW1	SDST3006Z	SCREW,X2
	SCW2	SDST3008Z	SCREW
	SCW3	SDST3006Z	SCREW,X2
	SLD1	PQ32861-1-1	SHIELD CASE(1)
	SLD2	PQ32863	SHIELD CASE(2)
⚠	SLD3	PQ44071	COVER,
⚠	TAB1	A74316	TAB,X2
	CN1	PU58844-7	CAP HOUSING
	CN2	PU58844-8	CAP HOUSING
⚠	F1	QMF51E2-1R0	FUSE
⚠		or QMF51E2-1R0J1	FUSE
⚠	F2	QMF51E2-2R0	FUSE
⚠		or QMF51E2-2R0J1	FUSE

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MAIN BOARD ASSEMBLY <03><06>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB10296A-01	MAIN BOARD ASSY,EG
		PB10296B-01	MAIN BOARD ASSY,E
⚠	RF1	PU59980M-6	RF CONVERTER/MIX BOOSTER
	BKT1	PQ32369	BRACKET
	CL1	PU59311-3	WIRE CLAMP,X3
	ETH1	PQ43012-1-1	EARTH PLATE
	RV1	PU56800	NYLON RIVET
	SCW1	SDST2605Z	SCREW
	SCW2	SDSF2608Z	SCREW,X2
	SPC1	PU60010	SPACER,X3
⚠	TB1	PQ20776-10	TERMINAL BOARD,E
⚠		PQ20776-7	TERMINAL BOARD,EG
	WR1	PW30401-BB19T	COAXIAL CORD
		or PW30402-BB19M	COAXIAL CORD
		or PW30401-BB19S	COAXIAL CORD
	J701	PU60612	EARPHONE JACK
		or PU61012	MINI JACK
	TP201	PU57545	TEST PIN,X11

— MIC MIX SECTION —

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC1	BA15218N	IC	
		or XRA15218N	IC	
	Q1	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q2	2SD1468S(RS)	TRANSISTOR	
	D1	1SS133	DIODE	
		or MA165	DIODE	
	R2	QRD161J-202	RESISTOR	2.0K, 1/6W
	R3	QRD161J-104	RESISTOR	100K, 1/6W
	R4	QRD161J-221	RESISTOR	220, 1/6W
	R5	QRD161J-273	RESISTOR	27K, 1/6W
	R6	QRD161J-154	RESISTOR	150K, 1/6W
	R7	QRD161J-222	RESISTOR	2.2K, 1/6W
	R8	QRD161J-223	RESISTOR	22K, 1/6W
	R9	QRD161J-683	RESISTOR	68K, 1/6W
	R10	QRD161J-102	RESISTOR	1.0K, 1/6W
	R11	QRD161J-222	RESISTOR	2.2K, 1/6W
	R12	QRD161J-222	RESISTOR	2.2K, 1/6W
	R13	QRD161J-122	RESISTOR	1.2K, 1/6W
	R14	QRD161J-222	RESISTOR	2.2K, 1/6W
	R15	QRD161J-222	RESISTOR	2.2K, 1/6W
	R16	QRD161J-223	RESISTOR	22K, 1/6W
	R17	QRD161J-222	RESISTOR	2.2K, 1/6W
	R18	QRD161J-101	RESISTOR	100, 1/6W
	C1	QENC1CM-106	NP E CAPACITOR	10μF, 16V
	C2	QENC1CM-106	NP E CAPACITOR	10μF, 16V
	C3	QETC1HM-105	E CAPACITOR	1.0μF, 50V
	C4	QEK61HM-105	E CAPACITOR	1.0μF, 50V
	C5	QETB1HM-105	E CAPACITOR	1.0μF, 50V
	C6	QEK61EM-475	E CAPACITOR	4.7μF, 25V
	C7	QETC1EM-475	E CAPACITOR	4.7μF, 25V
	C8	QETC1CM-476	E CAPACITOR	47μF, 16V
	C9	QETC1CM-476	E CAPACITOR	47μF, 16V
	C10	QETC1CM-476	E CAPACITOR	47μF, 16V
	C11	QCBB1HJ-151	CAPACITOR	150pF, 50V
	SLD1	PQ42581	PRE AMP SHIELD1	
	SLD2	PQ42583	PRE AMP SHIELD3	
	CN2	PU58844-5	CAP HOUSING	
	CN3	PU59555-4	CAP HOUSING	

— VIDEO SECTION —

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	Q201	DTC124ES	TRANSISTOR
	Q202	DTC144WS	TRANSISTOR
	Q203	2SA933S(RS)	TRANSISTOR
		or 2SA1267(YG)-TJK	TRANSISTOR
	Q204	2SC1740S(RS)	TRANSISTOR
		or 2SC3199(GB)-TJK	TRANSISTOR
	Q205	2SC1740S(RS)	TRANSISTOR
		or 2SC3199(GB)-TJK	TRANSISTOR
	Q206	2SC1740S(RS)	TRANSISTOR
		or 2SC3199(GB)-TJK	TRANSISTOR
	Q207	2SA933S(RS)	TRANSISTOR
		or 2SA1267(YG)-TJK	TRANSISTOR
	Q208	2SA933S(RS)	TRANSISTOR
		or 2SA1267(YG)-TJK	TRANSISTOR
	Q209	DTA114ES	TRANSISTOR
	Q210	2SA854S(QR)	TRANSISTOR
	Q308	DTA124ES	TRANSISTOR
	Q309	DTC124ES	TRANSISTOR

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D201	1SS133	DIODE	
		or MA165	DIODE	
	D202	1SS133	DIODE	
		or MA165	DIODE	
	D203	1SS133	DIODE	
		or MA165	DIODE	
	D204	1SS133	DIODE	
		or MA165	DIODE	
	D205	1SS133	DIODE	
		or MA165	DIODE	
	D206	1SS133	DIODE	
		or MA165	DIODE	
	D207	1SS133	DIODE	
		or MA165	DIODE	
	D209	1SS133	DIODE	
		or MA165	DIODE	
	D210	1SS133	DIODE	
		or MA165	DIODE	
	D211	1SS133	DIODE	
		or MA165	DIODE	
	D304	1SS133	DIODE	
		or MA165	DIODE	
	D306	1SS133	DIODE	
		or MA165	DIODE	
	D341	1SS133	DIODE	
		or MA165	DIODE	
	D342	1SS133	DIODE	
		or MA165	DIODE	
	R201	QRD161J-152	RESISTOR	1.5K, 1/6W
	R202	QRD161J-103	RESISTOR	10K, 1/6W
	R205	QRD161J-472	RESISTOR	4.7K, 1/6W
	R206	QRD161J-562	RESISTOR	5.6K, 1/6W
	R207	QRD161J-222	RESISTOR	2.2K, 1/6W
	R208	QRD161J-182	RESISTOR	1.8K, 1/6W
	R209	QRD161J-222	RESISTOR	2.2K, 1/6W
	R210	QRD161J-222	RESISTOR	2.2K, 1/6W
	R211	QRD161J-182	RESISTOR	1.8K, 1/6W
	R212	QRD161J-152	RESISTOR	1.5K, 1/6W
	R213	QRD161J-152	RESISTOR	1.5K, 1/6W
	R214	QRD161J-331	RESISTOR	330, 1/6W
	R215	QRD161J-561	RESISTOR	560, 1/6W
	R216	QRD161J-471	RESISTOR	470, 1/6W
	R217	QRD161J-222	RESISTOR	2.2K, 1/6W
	R218	QRD161J-153	RESISTOR	15K, 1/6W
	R219	QRD161J-103	RESISTOR	10K, 1/6W
	R220	QVZ3518-681AZ	V RESISTOR,SP REC COLOR	680
	R221	QRD161J-222	RESISTOR	2.2K, 1/6W
	R222	QRD161J-333	RESISTOR	33K, 1/6W
	R223	QRD161J-153	RESISTOR	15K, 1/6W
	R224	QRD161J-152	RESISTOR	1.5K, 1/6W
	R225	QRD161J-561	RESISTOR	560, 1/6W
	R226	QVZ3518-332AZ	V RESISTOR,SP FREQ	3.3K
	R227	QRD161J-101	RESISTOR	100, 1/6W
	R228	QRD161J-102	RESISTOR	1.0K, 1/6W
	R229	QRD161J-123	RESISTOR	12K, 1/6W
	R230	QRD161J-103	RESISTOR	10K, 1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R231	QRD123J-391SX	RESISTOR	390, 1/2W
	R232	QRD161J-472	RESISTOR	4.7K, 1/6W
	R233	QRD161J-682	RESISTOR	6.8K, 1/6W
	R234	QRD161J-101	RESISTOR	100, 1/6W
	R235	QRD161J-102	RESISTOR	1.0K, 1/6W
	R236	QRD161J-102	RESISTOR	1.0K, 1/6W
	R237	QRD161J-222	RESISTOR	2.2K, 1/6W
	R238	QRD161J-750	RESISTOR	75, 1/6W
	R239	QRD161J-750	RESISTOR	75, 1/6W
	R240	QRD161J-102	RESISTOR	1.0K, 1/6W
	R243	QRD161J-103	RESISTOR	10K, 1/6W
	R244	QRD161J-222	RESISTOR	2.2K, 1/6W
	R250	QRD161J-471	RESISTOR	470, 1/6W
	R316	QRD161J-223	RESISTOR	22K, 1/6W
	C201	QEN61AM-226	NP E CAPACITOR	22μF, 10V
	C202	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C203	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C204	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C205	QCBB1HJ-121	CAPACITOR	120pF, 50V
	C206	QCBB1HJ-121	CAPACITOR	120pF, 50V
	C207	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C208	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C209	QETC1CM-476	E CAPACITOR	47μF, 16V
	C210	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C211	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C212	QETC0JM-476	E CAPACITOR	47μF, 6.3V
	C213	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C214	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C215	QCSB1HJ-390	CAPACITOR	39pF, 50V
	C216	QETC1CM-476	E CAPACITOR	47μF, 16V
	C217	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C218	QETC0JM-477	E CAPACITOR	470μF, 6.3V
	C219	QETC0JM-476	E CAPACITOR	47μF, 6.3V
	C220	QCC31CJ-473	CAPACITOR	0.047μF, 16V
	C221	QETC1HM-474	E CAPACITOR	0.47μF, 50V
	C222	QETC1HM-105	E CAPACITOR	1.0μF, 50V
	C224	QCBB1HJ-102	CAPACITOR	0.001μF, 50V
	C240	QCC31CJ-333	CAPACITOR	0.033μF, 16V
	C302	QCSB1HJ-180	CAPACITOR	18pF, 50V
	C341	QFN31HJ-682	M CAPACITOR	0.0068μF, 50V
	L201	PU59152-221J	COIL	220μH
	L202	PU59152-560J	COIL	56μH
	L203	PU48530-101K	COIL	100μH
	L204	PU48530-101K	COIL	100μH
	L205	PU59152-180J	COIL	18μH
	L206	PU48530-101K	COIL	100μH
	L207	PU54710-222	COIL	2.2mH
	L305	PU59152-270J	COIL	27μH
	L341	PU48530-821J	COIL	820μH
	EQ201	PU54838	EQUALIZER	
		or PU60714	EQUALIZER	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	CN204	PU58844-6	CAP HOUSING
	CN205	PU59555-6	CAP HOUSING
	CN701	PU58844-6	CAP HOUSING

— SERVO SECTION —

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	IC401	HD49733NT	IC
	IC501	BU4066B	IC
		or MC14066BCP	IC
	IC502	BA10324	IC
		or LM324N	IC
	Q501	2SC3199(G)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
		or 2SC536SPA(FG)	TRANSISTOR
		or 2SC3311A(RS)	TRANSISTOR
	Q502	2SC3199(G)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
		or 2SC536SPA(FG)	TRANSISTOR
		or 2SC3311A(RS)	TRANSISTOR
	Q503	2SC3199(G)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
		or 2SC536SPA(FG)	TRANSISTOR
		or 2SC3311A(RS)	TRANSISTOR
	Q505	2SA1267(G)-TJK	TRANSISTOR
		or 2SA1309(RS)	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q506	2SC3199(G)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
		or 2SC3311A(RS)	TRANSISTOR
		or 2SC536SPA(FG)	TRANSISTOR
	Q507	DTC144WS	TRANSISTOR
	Q509	2SC3199(G)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
		or 2SC3311A(RS)	TRANSISTOR
		or 2SC536SPA(FG)	TRANSISTOR
	D401	1SS133	DIODE
		or MA165	DIODE
	D402	1SS133	DIODE
		or MA165	DIODE
	D403	1SS133	DIODE
		or MA165	DIODE
	D404	1SS133	DIODE
		or MA165	DIODE
	D407	1SS133	DIODE
		or MA165	DIODE
	D408	1SS133	DIODE
		or MA165	DIODE
	D409	1SS133	DIODE
		or MA165	DIODE
	D410	1SS133	DIODE
		or MA165	DIODE
	D501	OA90	DIODE
	D502	OA90	DIODE
	D503	RD9.1EB3	ZENER DIODE
	D505	1SS133	DIODE
		or MA165	DIODE
	D506	1SS133	DIODE
		or MA165	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R401	QRD161J-223	RESISTOR	22K, 1/6W
	R402	QRD161J-225	RESISTOR	2.2M, 1/6W
	R403	QRD161J-683	RESISTOR	68K, 1/6W
	R404	QRD161J-222	RESISTOR	2.2K, 1/6W
	R405	QRD161J-123	RESISTOR	12K, 1/6W
	R406	QRD161J-472	RESISTOR	4.7K, 1/6W
	R407	QRD161J-392	RESISTOR	3.9K, 1/6W
	R408	QRD161J-105	RESISTOR	1.0M, 1/6W
	R409	QRD161J-273	RESISTOR	27K, 1/6W
	R411	QRD161J-105	RESISTOR	1.0M, 1/6W
	R412	QRD161J-273	RESISTOR	27K, 1/6W
	R413	QRD161J-273	RESISTOR	27K, 1/6W
	R414	QRD161J-335	RESISTOR	3.3M, 1/6W
	R415	QRD161J-334	RESISTOR	330K, 1/6W
	R416	QRD161J-822	RESISTOR	8.2K, 1/6W
	R418	QRD161J-102	RESISTOR	1.0K, 1/6W
	R419	QRD161J-473	RESISTOR	47K, 1/6W
	R420	QVZ3518-684AZ	V RESISTOR,SP SW POINT	680K
		or QVZ3523-684AZ	V RESISTOR	680K
	R422	QRD161J-104	RESISTOR	100K, 1/6W
	R426	QRD161J-821	RESISTOR	820, 1/6W
	R427	QRD161J-102	RESISTOR	1.0K, 1/6W
	R428	QRD161J-105	RESISTOR	1.0M, 1/6W
	R429	QRD161J-102	RESISTOR	1.0K, 1/6W
	R430	QRD161J-102	RESISTOR	1.0K, 1/6W
	R434	QRD161J-102	RESISTOR	1.0K, 1/6W
	R435	QRD161J-102	RESISTOR	1.0K, 1/6W
	R436	QRD161J-274	RESISTOR	270K, 1/6W
	R437	QRD161J-274	RESISTOR	270K, 1/6W
	R438	QRD161J-224	RESISTOR	220K, 1/6W
	R439	QRD161J-103	RESISTOR	10K, 1/6W
	R501	QRD161J-104	RESISTOR	100K, 1/6W
	R502	QRD161J-104	RESISTOR	100K, 1/6W
	R503	QRD161J-102	RESISTOR	1.0K, 1/6W
	R504	QRD161J-102	RESISTOR	1.0K, 1/6W
	R505	QRD161J-683	RESISTOR	68K, 1/6W
	R506	QRD161J-562	RESISTOR	5.6K, 1/6W
	R507	QRD161J-222	RESISTOR	2.2K, 1/6W
	R508	QRD161J-101	RESISTOR	100, 1/6W
	R509	QRD161J-104	RESISTOR	100K, 1/6W
	R510	QRD161J-332	RESISTOR	3.3K, 1/6W
	R511	QRD161J-103	RESISTOR	10K, 1/6W
	R512	QRD161J-104	RESISTOR	100K, 1/6W
	R513	QRD161J-104	RESISTOR	100K, 1/6W
	R514	QRD161J-105	RESISTOR	1.0M, 1/6W
	R515	QRD161J-105	RESISTOR	1.0M, 1/6W
	R518	QRD161J-103	RESISTOR	10K, 1/6W
	R520	QRD161J-224	RESISTOR	220K, 1/6W
	R523	QRD161J-822	RESISTOR	8.2K, 1/6W
	R524	QRD161J-123	RESISTOR	12K, 1/6W
	R525	QRD161J-103	RESISTOR	10K, 1/6W
	R527	QRD161J-104	RESISTOR	100K, 1/6W
	R528	QRD161J-104	RESISTOR	100K, 1/6W
	R529	QRD161J-102	RESISTOR	1.0K, 1/6W
	R530	QRD161J-102	RESISTOR	1.0K, 1/6W
	C402	QEK61AM-226	E CAPACITOR	22μF, 10V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C403	QFV11HJ-224	TF CAPACITOR	0.22μF, 50V
	C404	QCC31CK-682	CAPACITOR	0.0068μF, 16V
	C405	QEK61EM-475	E CAPACITOR	4.7μF, 25V
	C406	QEK61EM-475	E CAPACITOR	4.7μF, 25V
	C407	QEK61CM-106	E CAPACITOR	10μF, 16V
	C408	QEK61CM-106	E CAPACITOR	10μF, 16V
	C409	QCC31CK-223	CAPACITOR	0.022μF, 16V
	C410	QFV71HJ-184	TF CAPACITOR	0.18μF, 50V
	C411	QCBB1HJ-471	CAPACITOR	470pF, 50V
	C412	QFL31HJ-682	M CAPACITOR	0.0068μF, 50V
	C414	QCBB1HJ-102	CAPACITOR	0.001μF, 50V
	C415	QEK61AM-226	E CAPACITOR	22μF, 10V
	C416	QEK61AM-226	E CAPACITOR	22μF, 10V
	C417	QCBB1HJ-271	CAPACITOR	270pF, 50V
	C418	QCBB1HJ-561	CAPACITOR	560pF, 50V
	C419	QCBB1HJ-102	CAPACITOR	0.001μF, 50V
	C420	QEK61HM-105	E CAPACITOR	1.0μF, 50V
	C421	QCBB1HJ-102	CAPACITOR	0.001μF, 50V
	C422	QFV71HJ-563	TF CAPACITOR	0.056μF, 50V
	C423	QCBB1HJ-102	CAPACITOR	0.001μF, 50V
	C427	QCBB1HJ-181	CAPACITOR	180pF, 50V
	C501	QCVB1CM-103	CAPACITOR	0.01μF, 16V
	C502	QCBB1HJ-271	CAPACITOR	270pF, 50V
	C504	QCVB1CM-103	CAPACITOR	0.01μF, 16V
	C505	QCVB1CM-103	CAPACITOR	0.01μF, 16V
	C507	QCVB1CM-103	CAPACITOR	0.01μF, 16V
	C508	QCVB1CM-103	CAPACITOR	0.01μF, 16V
	C509	QCVB1CM-103	CAPACITOR	0.01μF, 16V
	C510	QEK61CM-106	E CAPACITOR	10μF, 16V
	C511	QEK61CM-106	E CAPACITOR	10μF, 16V
	C512	QCVB1CM-103	CAPACITOR	0.01μF, 16V
	C513	QFV71HJ-473	TF CAPACITOR	0.047μF, 50V
	C514	QCVB1CM-103	CAPACITOR	0.01μF, 16V
	C515	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	L502	PU59152-270J	COIL	27μH
	CN401	PU59555-4	CAP HOUSING	
	CN402	PU58844-3	CAP HOUSING	
	CN501	PU59555-2	CAP HOUSING	
⚠	CP401	ICP-F15	CIRCUIT PROTECTOR	

— MECHACON SECTION —

REF. No.	PART No.	PART NAME, DESCRIPTION
IC601	M37418M6-185SP	IC
	or M37418M6-186SP	IC
IC602	CAT35C104P-001	IC,EG
	CAT35C104P-002	IC,E
Q601	DTC144ES	TRANSISTOR
D601	1SS133	DIODE
	or MA165	DIODE
D602	1SS133	DIODE
	or MA165	DIODE
D603	1SS133	DIODE
	or MA165	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D604	1SS133	DIODE	
		or MA165	DIODE	
	D605	HZS7.5EB2	ZENER DIODE	
		or MTZ7.5B	ZENER DIODE	
	D606	1SS133	DIODE	
		or MA165	DIODE	
	D607	1SS133	DIODE	
		or MA165	DIODE	
	D608	1SS133	DIODE	
		or MA165	DIODE	
	D609	1SS133	DIODE	
		or MA165	DIODE	
	R601	QRD161J-332	RESISTOR	3.3K, 1/6W
	R602	QRD161J-332	RESISTOR	3.3K, 1/6W
	R603	QRD161J-103	RESISTOR	10K, 1/6W
	R604	QRD161J-472	RESISTOR	4.7K, 1/6W
	R605	QRD161J-102	RESISTOR	1.0K, 1/6W
	R606	QRD161J-472	RESISTOR	4.7K, 1/6W
	R607	QRD161J-472	RESISTOR	4.7K, 1/6W
	R608	QRD161J-472	RESISTOR	4.7K, 1/6W
	R609	QRD161J-472	RESISTOR	4.7K, 1/6W
	R610	QRD161J-102	RESISTOR	1.0K, 1/6W
	R611	QRD161J-102	RESISTOR	1.0K, 1/6W
	R612	QRD161J-472	RESISTOR	4.7K, 1/6W
	R613	QRD161J-102	RESISTOR	1.0K, 1/6W
	R614	QRD161J-103	RESISTOR	10K, 1/6W
	R615	QRD161J-472	RESISTOR	4.7K, 1/6W
	R616	QRD161J-103	RESISTOR	10K, 1/6W
	R617	QRD161J-472	RESISTOR	4.7K, 1/6W
	R618	QRD161J-472	RESISTOR	4.7K, 1/6W
	R619	QRD161J-102	RESISTOR	1.0K, 1/6W
	R620	QRD161J-103	RESISTOR	10K, 1/6W
	R621	QRD161J-472	RESISTOR	4.7K, 1/6W
	R622	QRD161J-105	RESISTOR	1.0M, 1/6W
	R623	QRD161J-103	RESISTOR	10K, 1/6W
	R626	QRD161J-333	RESISTOR	33K, 1/6W
	R627	QRD161J-563	RESISTOR	56K, 1/6W
	R628	QRD161J-124	RESISTOR	120K, 1/6W
	R629	QRD161J-103	RESISTOR	10K, 1/6W
	R630	QRD161J-333	RESISTOR	33K, 1/6W
	R631	QRD161J-471	RESISTOR	470, 1/6W
	R632	QRD161J-822	RESISTOR	8.2K, 1/6W
	R633	QRD161J-103	RESISTOR	10K, 1/6W
	R634	QRD161J-103	RESISTOR	10K, 1/6W
	R635	QRD161J-102	RESISTOR	1.0K, 1/6W
	R636	QRD161J-273	RESISTOR	27K, 1/6W
	R637	QRD161J-472	RESISTOR	4.7K, 1/6W
	R638	QRD161J-152	RESISTOR	1.5K, 1/6W
	RA601	QRB037J-103	RESISTOR ARRAY	
	RA602	QRB037J-333	NETWORK RESISTOR	
	C601	QEK61EM-335	E CAPACITOR	3.3μF, 25V
	C602	QCFB1EZ-223	CAPACITOR	0.022μF, 25V
	C603	QCC11EK-104	CAPACITOR	0.1μF, 25V
	C604	QEK60JM-107	E CAPACITOR	100μF, 6.3V
	C605	QEK61HM-105	E CAPACITOR	1.0μF, 50V
	C606	QCBB1HJ-121	CAPACITOR	120pF, 50V
	C607	QCBB1HJ-471	CAPACITOR	470pF, 50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	L601	PU59152-2R2J	COIL	
⚠	CF601	PU60440	RESONATOR	
	CN602	PU59555-4	CAP HOUSING	
	CN603	PU59555-12	CAP HOUSING	
	CN604	PU59555-8	CAP HOUSING	
	CN605	PU59555-8	CAP HOUSING	
	CN606	PU59555-6	CAP HOUSING	
⚠	CP601	ICP-F25	CIRCUIT PROTECTOR	

— REGULATOR SECTION —

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC801	MC7805ACT	IC	
	Q801	2SB1068(KU)	TRANSISTOR	
	Q802	2SD1856	TRANSISTOR	
	Q803	2SD1796	TRANSISTOR	
	Q804	2SC1740S	TRANSISTOR	
	Q805	DTB114ES	TRANSISTOR	
⚠	Q851	2SA854S(R)	TRANSISTOR	
	D802	HZS3.9EB2TJ	DIODE	
	D803	1SS133	DIODE	
	or	MA165	DIODE	
	D851	1SS133	DIODE	
	or	MA165	DIODE	
	D852	1SS133	DIODE	
	or	MA165	DIODE	
	D853	1SS133	DIODE	
	or	MA165	DIODE	
	R801	QRD161J-103	RESISTOR	10K, 1/6W
	R802	QRD161J-222	RESISTOR	2.2K, 1/6W
	R803	QRD161J-102	RESISTOR	1.0K, 1/6W
	R804	QRD161J-561	RESISTOR	560, 1/6W
	R805	QRD161J-221	RESISTOR	220, 1/6W
	R807	QVZ3518-471AZ	V RESISTOR,SWD 5V ADJ	470
	R808	QRD161J-122	RESISTOR	1.2K, 1/6W
	R809	QRD161J-102	RESISTOR	1.0K, 1/6W
	R810	QRD161J-132	RESISTOR	1.3K, 1/6W
⚠	R811	QRZ0077-220X	FUSIBLE RESISTOR	22
	R812	QRG029J-332A	OMF RESISTOR	3.3K, 2W
	R851	QRD161J-393	RESISTOR	39K, 1/6W
	R852	QRD161J-102	RESISTOR	1.0K, 1/6W
	C801	QETC1JM-106	E CAPACITOR	10µF, 63V
	C802	QETC1CM-107	E CAPACITOR	100µF, 16V
	C803	QETB1CM-228	E CAPACITOR	2200µF, 16V
	C804	QETC1CM-107	E CAPACITOR	100µF, 16V
	C805	QETC0JM-107	E CAPACITOR	100µF, 6.3V
	C806	QETC0JM-107	E CAPACITOR	100µF, 6.3V
	C807	QFL41HJ-103	MY CAP	0.01µF, 50V
	C808	QETC0JM-107	E CAPACITOR	100µF, 6.3V
	C809	QETB1CM-228	E CAPACITOR	2200µF, 16V
	C811	QETB1AM-228	E CAPACITOR	2200µF, 10V
	C812	QEZ0093-187	E CAPACITOR	1800µF
	C813	QETA1CM-107	E CAPACITOR	100µF, 16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	L801	PU60943-181K	COIL	
	L851	PU59152-100J	COIL	
	L853	PU59152-101J	COIL	
	HS801	PU61120	HEAT SHINK	
	SCW801	SDST3008Z	SCREW,X2	
	TP801	PU57545	TEST PIN,X3	
	CN801	PU58844-8	CAP HOUSING	
	CN802	PU58844-3	CAP HOUSING	
	CP801	ICP-F38	CIRCUIT PROTECTOR	
	CP802	ICP-F38	CIRCUIT PROTECTOR	
	CP803	ICP-F38	CIRCUIT PROTECTOR	
	CP805	ICP-F20	CIRCUIT PROTECTOR	

— TERMINAL BOARD ASSEMBLY <06> —

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA1	PB30080E	TERMINAL BOARD ASSY,E	
		PB30080D	TERMINAL BOARD ASSY,EG	
	IC1	LA7222	IC	
	IC2	BA15218	IC	
	or	M5218P	IC	
	D1	1SS133	DIODE	
	or	MA165	DIODE	
	D2	1SS133	DIODE	
	or	MA165	DIODE	
	R1	QRD161J-471	RESISTOR	470, 1/6W
	R2	QRD161J-471	RESISTOR	470, 1/6W
	R3	QRD161J-103	RESISTOR	10K, 1/6W
	R4	QRD161J-103	RESISTOR	10K, 1/6W
	R5	QRD161J-273	RESISTOR	27K, 1/6W
	R6	QRD161J-273	RESISTOR	27K, 1/6W
	R7	QRD161J-563	RESISTOR	56K, 1/6W
	R8	QRD161J-563	RESISTOR	56K, 1/6W
	R9	QRD161J-563	RESISTOR	56K, 1/6W
	R10	QRD161J-563	RESISTOR	56K, 1/6W
	R11	QRD161J-471	RESISTOR	470, 1/6W
	R12	QRD161J-471	RESISTOR	470, 1/6W
	R13	QRD161J-223	RESISTOR	22K, 1/6W
	C1	QEK61HM-475	E CAPACITOR	4.7µF, 50V
	C2	QEK61HM-475	E CAPACITOR	4.7µF, 50V
	C3	QER61CM-106	E CAPACITOR	10µF, 16V
	C4	QEK61CM-106	E CAPACITOR	10µF, 16V
	C6	QEP61EM-475	NP E CAPACITOR	4.7µF, 25V
	C7	QEP61EM-475	NP E CAPACITOR	4.7µF, 25V
	C8	QCBB1HJ-821	CAPACITOR	820pF, 50V
	C9	QCBB1HJ-821	CAPACITOR	820pF, 50V
	C10	QCXB1CM-182	CAPACITOR	0.0018µF, 16V
	C11	QCXB1CM-182	CAPACITOR	0.0018µF, 16V
	L1	PU59152-120J	COIL	12µH
	L2	PU59152-120J	COIL	12µH
	K1	PU60281-5	FERRITE BEADS	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	JP1	PU60770-111	PIN HEADER
	SCW1	SDSF2608Z	SCREW,X3
	TB1	PU60677	CONN.BOARD ASSY
	CN1	PU58844-3	CAP HOUSING,E
	CN1	PU58844-5	CAP HOUSING,EG
	CN2	PU59555-4	CAP HOUSING

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VIDEO UNIT BOARD ASSEMBLY <05>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB10256A-03	VIDEO UNIT BOARD ASSY
	IC1	PB20166G-01	Y MODULE BOARD ASSY
⚠	IC2	MSM6967RS	IC
	IC201	PB20227A	COLOR MODULE BOARD ASSY
	IC251	BA7106LS	IC
	Q1	DTA144EU	TRANSISTOR
	Q2	2SC2412K	TRANSISTOR
	Q3	DTC144EK	TRANSISTOR
	Q4	2SA1037K	TRANSISTOR
	Q5	2SC2412K	TRANSISTOR
	Q201	2SC2412K	TRANSISTOR
	Q202	2SC2412K	TRANSISTOR
	Q203	DTC124EK	TRANSISTOR
	Q204	2SC2412K	TRANSISTOR
	Q205	2SA1037K	TRANSISTOR
	Q251	DTC124EK	TRANSISTOR
	D1	1SS133	DIODE
	or	MA165	DIODE
	D2	1SS133	DIODE
	or	MA165	DIODE
	D3	1SS133	DIODE
	or	MA165	DIODE
	D4	1SS133	DIODE
	or	MA165	DIODE
	D5	1SS292	DIODE
	D6	1SS133	DIODE
	or	MA165	DIODE
	D7	1SS133	DIODE
	or	MA165	DIODE
	D9	RD9.1ES-T1B2	ZENER DIODE
	or	UZ9.1BSB	ZENER DIODE
	D10	1SS133	DIODE
	or	MA165	DIODE
	D201	1SS133	DIODE
	or	MA165	DIODE
	D202	1SS133	DIODE
	or	MA165	DIODE
	D203	1SS133	DIODE
	or	MA165	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D251	1SS133	DIODE	
	or	MA165	DIODE	
	D252	1SS133	DIODE	
	or	MA165	DIODE	
	D253	1SS133	DIODE	
	or	MA165	DIODE	
	R1	QRSA08J-103YN	RESISTOR	10K, 1/10W
	R2	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
	R3	QRSA08J-681YN	RESISTOR	680, 1/10W
	R5	QRSA08J-562YN	RESISTOR	5.6K, 1/10W
	R6	QRSA08J-103YN	RESISTOR	10K, 1/10W
	R7	QRSA08J-104YN	RESISTOR	100K, 1/10W
	R8	QRSA08J-273YN	RESISTOR	27K, 1/10W
	R9	QRSA08J-394YN	RESISTOR	390K, 1/10W
	R10	QRSA08J-103YN	RESISTOR	10K, 1/10W
	R11	QRSA08J-221YN	RESISTOR	220, 1/10W
	R12	QRSA08J-222YN	RESISTOR	2.2K, 1/10W
	R13	QRSA08J-221YN	RESISTOR	220, 1/10W
	R14	QRSA08J-222YN	RESISTOR	2.2K, 1/10W
	R15	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
	R16	QVZ3518-222AZ	V RESISTOR,NC BALANCE	2.2K
	or	QVZ3523-222AZ	V RESISTOR	2.2K
	R17	QRSA08J-222YN	RESISTOR	2.2K, 1/10W
	R18	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
⚠	R20	QRD161J-181	RESISTOR	180, 1/6W
	R201	QRSA08J-183YN	RESISTOR	18K, 1/10W
	R202	QRSA08J-332YN	RESISTOR	3.3K, 1/10W
	R203	QRD161J-222	RESISTOR	2.2K, 1/6W
	R204	QRSA08J-333YN	RESISTOR	33K, 1/10W
	R205	QRD161J-223	RESISTOR	22K, 1/6W
	R206	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
	R207	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
	R208	QRSA08J-223YN	RESISTOR	22K, 1/10W
	R209	QRSA08J-391YN	RESISTOR	390, 1/10W
	R210	QRSA08J-333YN	RESISTOR	33K, 1/10W
	R211	QRSA08J-333YN	RESISTOR	33K, 1/10W
	R212	QRSA08J-152YN	RESISTOR	1.5K, 1/10W
	R213	QRSA08J-331YN	RESISTOR	330, 1/10W
	R214	QRSA08J-222YN	RESISTOR	2.2K, 1/10W
	R215	QRSA08J-332YN	RESISTOR	3.3K, 1/10W
	R216	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
	R217	QRSA08J-393YN	RESISTOR	39K, 1/10W
	R218	QRSA08J-332YN	RESISTOR	3.3K, 1/10W
	R219	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
	R220	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
	R221	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
	R222	QRSA08J-391YN	RESISTOR	390, 1/10W
	R223	QRSA08J-821YN	RESISTOR	820, 1/10W
	R224	QRSA08J-471YN	RESISTOR	470, 1/10W
	R251	QRSA08J-223YN	RESISTOR	22K, 1/10W
	R252	QRSA08J-333YN	RESISTOR	33K, 1/10W
	R253	QRD161J-273	RESISTOR	27K, 1/6W
	R254	QRSA08J-914YN	RESISTOR	910K, 1/10W
	R255	QRSA08J-103YN	RESISTOR	10K, 1/10W
	R256	QRSA08J-104YN	RESISTOR	100K, 1/10W
	C1	QCSA1HJ-220	CAPACITOR	22pF, 50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C2	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C3	QCSA1HJ-151	CAPACITOR	150pF, 50V
	C4	QETC1AM-226	E CAPACITOR	22μF, 10V
	C5	QCYA1HK-102	CAPACITOR	0.001μF, 50V
	C6	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C7	QETC1EM-335	E CAPACITOR	3.3μF, 25V
	C8	QEN60JM-336	NP E CAPACITOR	33μF, 6.3V
	C9	QETC1CM-106	E CAPACITOR	10μF, 16V
	C10	QCYA1HK-102	CAPACITOR	0.001μF, 50V
	C11	QCYA1HK-102	CAPACITOR	0.001μF, 50V
	C12	QEN61HM-224	NP E CAPACITOR	0.22, 50V
	C13	QCSA1HJ-120	CAPACITOR	12pF, 50V
	C14	QETC1EM-335	E CAPACITOR	3.3μF, 25V
	C15	QCVC1CN-103	CAPACITOR	0.01μF, 16V
	C16	QEN61HM-335	NP E CAPACITOR	3.3μF, 50V
	C17	QETC0JM-337	E CAPACITOR	330μF, 6.3V
	C18	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C19	QEN61HM-225	NP E CAPACITOR	2.2μF, 50V
	C20	QCSA1HJ-120	CAPACITOR	12pF, 50V
	C21	QETC1EM-475	E CAPACITOR	4.7μF, 25V
	C22	QETC1EM-475	E CAPACITOR	4.7μF, 25V
	C23	QETC0JM-476	E CAPACITOR	47μF, 6.3V
	C24	QETC1HM-104	E CAPACITOR	0.1μF, 50V
	C25	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C26	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C27	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C28	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C29	QETC1AM-476	E CAPACITOR	47μF, 10V
	C201	QCSA1HJ-470	CAPACITOR	47pF, 50V
	C202	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C203	QCSA1HJ-820	CAPACITOR	82pF, 50V
	C204	QETC1HM-475	E CAPACITOR	4.7μF, 50V
	C205	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C206	QFN31HJ-224	M CAPACITOR	0.22μF, 50V
	C207	QFN31HJ-563	M CAPACITOR	0.056μF, 50V
	C208	QETC0JM-337	E CAPACITOR	330μF, 6.3V
	C209	QCC31CJ-223	CAPACITOR	0.022μF, 16V
	C210	QER60JM-107	E CAPACITOR	100μF, 6.3V
	C211	QER61CM-106	E CAPACITOR	10μF, 16V
	C212	QETC1HM-224	E CAPACITOR	0.22μF, 50V
	C213	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C214	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C215	QETC1HM-474	E CAPACITOR	0.47μF, 50V
	C218	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C219	QCC11CJ-473	CAPACITOR	0.047μF, 16V
	C220	QCBB1HJ-121	CAPACITOR	120pF, 50V
	C221	QCBB1HJ-102	CAPACITOR	0.001μF, 50V
	C251	QETC1CM-106	E CAPACITOR	10μF, 16V
	C252	QFN31HJ-471	M CAPACITOR	470pF, 50V
	C253	QCSA1HJ-270	CAPACITOR	27pF, 50V
	C254	QETC1HM-335	E CAPACITOR	3.3μF, 50V
	C255	QCYA1HK-472	CAPACITOR	0.0047μF, 50V
	C256	QCYA1HK-471	CAPACITOR	470pF, 50V
	C257	QCSA1HJ-5R0	CAPACITOR	5pF, 50V
	C258	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C259	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C260	QCFA1HZ-103	CAPACITOR	0.01μF, 50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C261	QCSA1HJ-200	CAPACITOR	20pF, 50V
	C262	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C263	QETB0JM-477	E CAPACITOR	470μF, 6.3V
	C264	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C265	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	L1	PU59152-121J	COIL	120μH
	L2	PU59152-680J	COIL	68μH
	L3	PU48530-101K	COIL	100μH
	L4	PU48530-101K	COIL	100μH
	L5	PU59152-101J	COIL	100μH
	L6	PU48530-101K	COIL	100μH
	L201	PU48530-271J	COIL	270μH
	L202	PU59153-822J	COIL	8.2mH
⚠	L203	PU48530-151J	COIL	150μH
	L205	PU59152-150J	COIL	150μH
	L251	PU59152-330J	COIL	33μH
	L252	PU48530-101K	COIL	100μH
	EQ2	PU60162-2	EQUALIZER	
	or	PU60162	EQUALIZER	
	EQ201	PU53501-11	EQUALIZER	
	or	PU53501-6	EQUALIZER	
	LPF1	PU58021-3	LOW PASS FILTER	
	or	PU60715	LOW PASS FILTER	
	or	PU58021-2	LOW PASS FILTER	
	LPF2	PU60716	LOW PASS FILTER	
	LPF201	PU58022	LOW PASS FILTER	
	BPF201	PU60654-2	BAND PASS FILTER	
	or	PU60654	BAND PASS FILTER	
	BPF202	PU60713	BAND PASS FILTER	
	CF201	PU57073	CERAMIC FILTER	
	DL201	PU60340	COMB FILTER	
	or	PU60490	COMB FILTER	
	or	PU60222	2H DELAY LINE	
	or	PU58971-3	2H DELAY LINE	
	LC251	PU60655	COIL,SECAM DET	
⚠	X201	PU60653	CRYSTAL UNITS	
	SLD1	PQ42994	SHIELD PLATE	
	SLD2	PQ42995	SHIELD CASE	
	SLD3	PQ42996	SHIELD COVER	
	TP21	PU56347	TEST POINT	
	CN1	PU60330-113	CONNECTOR	
	CN2	PU60330-113	CONNECTOR	
	CN3	PU60330-110	TERMINAL	

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IF BOARD ASSEMBLY <07>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10047AG	IF BOARD ASSEMBLY	
	IC1	M51365SP	IC	
	Q1	2SC3354	TRANSISTOR	
	Q2	2SC3354	TRANSISTOR	
	Q3	2SC1317(RS)	TRANSISTOR	
	Q4	2SA933S(S)	TRANSISTOR	
	Q5	2SC1740(RS)	TRANSISTOR	
	or	2SC3311A(RS)	TRANSISTOR	
	or	2SC536SPA(FG)	TRANSISTOR	
	Q6	2SA933S(RS)	TRANSISTOR	
	or	2SA1309AR,S	TRANSISTOR	
	Q7	2SC1740(RS)	TRANSISTOR	
	or	2SC3311A(RS)	TRANSISTOR	
	or	2SC536SPA(FG)	TRANSISTOR	
	Q10	2SC3354	TRANSISTOR	
	Q11	2SC1740(RS)	TRANSISTOR	
	or	2SC3311A(RS)	TRANSISTOR	
	or	2SC536SPA(FG)	TRANSISTOR	
	Q12	DTC144ES	TRANSISTOR	
	or	2SC3399	TRANSISTOR	
	or	UN4213	TRANSISTOR	
	Q13	DTC144ES	TRANSISTOR	
	or	2SC3399	TRANSISTOR	
	or	UN4213	TRANSISTOR	
	Q15	2SK381(CD)	FE TRANSISTOR	
	D1	MTZ10D	ZENER DIODE	
	D6	1SS133	DIODE	
	D7	1SS133	DIODE	
	D8	1SS133	DIODE	
	R1	NRD718J-750NBU	RESISTOR	75,1/8W
	R4	NRD718J-332NBU	RESISTOR	3.3K, 1/8W
	R5	NRD718J-151NBU	RESISTOR	150, 1/8W
	R6	NRD718J-182NBU	RESISTOR	1.8K, 1/8W
	R7	NRD718J-331NBU	RESISTOR	330, 1/8W
	R8	NRD718J-681NBU	RESISTOR	680, 1/8W
	R10	NRD718J-271NBU	RESISTOR	270, 1/8W
	R11	NRD718J-101NBU	RESISTOR	100, 1/8W
	R15	NRD718J-271NBU	RESISTOR	270, 1/8W
	R17	NRD718J-562NBU	RESISTOR	5.6K, 1/8W
	R18	NRD718J-332NBU	RESISTOR	3.3K, 1/8W
	R19	NRD718J-222NBU	RESISTOR	2.2K, 1/8W
	R20	NRD718J-222NBU	RESISTOR	2.2K, 1/8W
	R21	QVZ3518-472	V RESISTOR,AGC	4.7K
	or	QVZ3523-472	V RESISTOR	4.7K
	R22	NRD718J-824NBU	RESISTOR	82[illegible] W
	R24	NRD718J-821NBU	RESISTOR	[illegible]
	R31	NRD718J-222NBU	RESISTOR	2.2K, 1/8W
	R32	NRD718J-102NBU	RESISTOR	1.0K, 1/8W
	R33	NRD718J-223NBU	RESISTOR	22K, 1/8W
	R34	NRD718J-470NBU	RESISTOR	47, 1/8W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R35	NRD718J-561NBU	RESISTOR	560, 1/8W
	R36	NRD718J-561NBU	RESISTOR	560, 1/8W
	R37	NRD718J-121NBU	RESISTOR	120, 1/8W
	R38	NRD718J-152NBU	RESISTOR	1.5K, 1/8W
	R39	NRD718J-272NBU	RESISTOR	2.7K, 1/8W
	R40	QVZ3518-103	V RESISTOR,COLOR LEVEL	10K
	or	QVZ3523-103	V RESISTOR	10K
	R45	NRD718J-471NBU	RESISTOR	470, 1/8W
	R46	NRD718J-104NBU	RESISTOR	0.1, 1/8W
	R47	NRD718J-153NBU	RESISTOR	15K, 1/8W
	R48	NRD718J-392NBU	RESISTOR	3.9K, 1/8W
	R49	NRD718J-103NBU	RESISTOR	10K, 1/8W
	R50	NRD718J-471NBU	RESISTOR	470, 1/8W
	R51	NRD718J-223NBU	RESISTOR	22K, 1/8W
	R52	NRD718J-223NBU	RESISTOR	22K, 1/8W
	R53	NRD718J-103NBU	RESISTOR	10K, 1/8W
	R54	NRD718J-682NBU	RESISTOR	6.8K, 1/8W
	R57	NRD718J-153NBU	RESISTOR	15K, 1/8W
	R62	NRD718J-392NBU	RESISTOR	3.9K, 1/8W
	R63	NRD718J-470NBU	RESISTOR	47, 1/8W
	R64	NRD718J-182NBU	RESISTOR	1.8K, 1/8W
	R65	NRD718J-221NBU	RESISTOR	220, 1/8W
	R71	NRD718J-681NBU	RESISTOR	680, 1/8W
	R72	NRD718J-820NBU	RESISTOR	82, 1/8W
	R73	NRD718J-331NBU	RESISTOR	330, 1/8W
	R82	NRD718J-680NBU	RESISTOR	68, 1/8W
	R83	NRD718J-222NBU	RESISTOR	2.2K, 1/8W
	R84	NRD718J-393NBU	RESISTOR	39K, 1/8W
	R85	NRD718J-752NBU	RESISTOR	7.5K, 1/8W
	R86	NRD718J-222NBU	RESISTOR	2.2K, 1/8W
	R100	QRD161J-105	RESISTOR	1.0M, 1/6W
	R101	NRD718J-182NBU	RESISTOR	1.8K,1/8W
	R102	NRD718J-222NBU	RESISTOR	2.2K,1/8W
	R104	QRD161J-393	RESISTOR	39K, 1/6W
	R105	QRD161J-0R0	RESISTOR	0, 1/6W
	C2	NCT02CH-3R9NBR	CAPACITOR	3.9pF, 160V
	C3	QCT25HH-101	CAPACITOR	100pF
	C4	NCT02CH-4R7NBR	CAPACITOR	4.7pF, 160V
	C5	NCB71HK-102NBR	CAPACITOR	0.001μF, 50V
	C6	NCX71CM-222NBR	CAPACITOR	0.0022μF, 16V
	C7	NCB71HK-102NBR	CAPACITOR	0.001μF, 50V
	C8	NCB71HK-102NBR	CAPACITOR	0.001μF, 50V
	C10	QETC1CM-336	E CAPACITOR	33μF, 16V
	C11	NCY71CM-103NBR	CAPACITOR	0.01μF, 16V
	C13	NCX71CM-222NBR	CAPACITOR	0.0022μF, 16V
	C14	PU57601-474ME	E CAPACITOR	0.47μF
	C15	QETC1CM-336	E CAPACITOR	33μF, 16V
	C16	NCX71CM-222NBR	CAPACITOR	0.0022μF, 16V
	C17	NCF71EZ-223NBR	CAPACITOR	0.022μF, 25V
	C19	NCY71CM-103NBR	CAPACITOR	0.01μF, 16V
	C20	NCY71CM-103NBR	CAPACITOR	0.01μF, 16V
	C21	NCB71HK-101NBR	CAPACITOR	100pF, 50V
	C24	QETC1HM-105	E CAPACITOR	1.0μF, 50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C25	NCX71CM-222NBR	CAPACITOR	0.0022μF, 16V
	C26	QFN31HK-222	M CAPACITOR	0.0022μF, 50V
	C27	QETC1HM-474	E CAPACITOR	0.47μF, 50V
	C29	NCS71HJ-470NBR	CAPACITOR	47pF, 50V
	C31	QETC1HM-335	E CAPACITOR	3.3μF, 50V
	C32	NCF71EZ-223NBR	CAPACITOR	0.022μF, 25V
	C33	QETC1HM-474	E CAPACITOR	0.47μF, 50V
	C41	NCB71HK-102NBR	CAPACITOR	0.001μF, 50V
	C43	NCX71CM-222NBR	CAPACITOR	0.0022μF, 16V
	C44	NCB71HK-102NBR	CAPACITOR	0.001μF, 50V
	C45	NCB71HK-102NBR	CAPACITOR	0.001μF, 50V
	C46	NCB71HK-102NBR	CAPACITOR	0.001μF, 50V
	C50	QETC1CM-336	E CAPACITOR	33μF, 16V
	C56	QETC1CM-336	E CAPACITOR	33μF, 16V
	C58	NCS71HJ-100NBR	CAPACITOR	10pF, 50V
	C60	NCB71HK-102NBR	CAPACITOR	0.001μF, 50V
	C63	NCB71HK-102NBR	CAPACITOR	0.001μF, 50V
	C64	NCB71HK-391NBR	CAPACITOR	390pF, 50V
	L1	PU60025-1R0	COIL	1μH
	L2	PU60025-1R2	COIL	1.2μH
	L3	PU60025-1R5	COIL	1.5μH
	L4	PU59152-8R2J	COIL	8.2μH
	L5	PU59152-220J	COIL	22μH
	L6	PU59152-6R8K	COIL	6.8μH
	L7	PU59152-R22K	COIL	0.22μH
	L9	PU59152-6R8K	COIL	6.8μH
	CF1	PU49295-2	N FILTER	
	CF3	PU32990-2	CERAMIC FILTER,5.5MHZ	
	CF4	PU49295	CERAMIC FILTER,5.5MHZ	
	CF5	PU32990-4	CERAMIC FILTER,5.5MHZ	
	SAW1	PU35557-7	SAW FILTER	
	SAW2	PU60765	SAW FILTER	
	T1	PU60042-2	COIL	
	T2	PU60497	IF.TRANSFORMER,VCO	
	T4	PU59488	COIL	
	T5	PU60046	IF.TRANSFORMER,SYNC	
	T8	PU60259	COIL, BUZZ	
	JP1	PU59935-16	TERMINAL	

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TUNER CONTROL BOARD ASSY <08>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
⚠	PWBA	PB20326C	TUNER/CONTROL BOARD ASSY,EG	
	PWBA	PB20326D-01	TUNER/CONTROL BOARD ASSY,E	
⚠	TNR1	PU36500	UHF/VHF TUNER,EG	
⚠		PU36508-1-1	UHF/VHF TUNER,E	
	Q2	2SD1863(QR)	TRANSISTOR	
		or 2SC3243D,E	TRANSISTOR	
	Q3	2SB810H,J	TRANSISTOR	
	Q4	DTC144ES	TRANSISTOR	
		or UN4213	TRANSISTOR	
		or 2SC3399	TRANSISTOR	
	Q6	2SC3354	TRANSISTOR	
	D1	HZT33-02	ZENER DIODE	
	D2	E-452-2	DIODE	
	D3	RD5.6ES-T1B3	ZENER DIODE	
		or MTZ5.6CT-77	ZENER DIODE	
	D4	1SS133	DIODE	
	D5	1SS133	DIODE	
	R2	QRD161J-104	RESISTOR	100K, 1/6W
	R3	QRD161J-153	RESISTOR	15K, 1/6W
	R7	QRD161J-271	RESISTOR	270, 1/6W
	R8	QRD161J-153	RESISTOR	15K, 1/6W
	R9	QRD161J-182	RESISTOR	1.8K, 1/6W
	R30	QRD161J-331	RESISTOR	330, 1/6W
	R32	QRD161J-103	RESISTOR	10K, 1/6W
	R34	QRD161J-103	RESISTOR	10K, 1/6W
	R36	QRD161J-560	RESISTOR	56, 1/6W
	C1	QETC1CM-107	E CAPACITOR	100μF, 16V
	C2	QETC1HM-225	E CAPACITOR	2.2μF, 50V
	C4	QCBB1HK-102	CAPACITOR	0.001μF, 50V
	C5	QCBB1HK-102	CAPACITOR	0.001μF, 50V
	C6	QCBB1HJ-331	CAPACITOR	330pF, 50V
	C7	QCBB1HK-102	CAPACITOR,E	0.001μF, 50V
		QCBB1HJ-471	CAPACITOR,EG	470pF, 50V
	C14	QETC1CM-336	E CAPACITOR	33μF, 16V
	C15	QETC1CM-107	E CAPACITOR	100μF, 16V
	C16	QETC1CM-106	E CAPACITOR	10μF, 16V
	C23	QETC1HM-106	E CAPACITOR	10μF, 50V
	C26	QCBB1HJ-471	CAPACITOR	470pF, 50V
	C28	QETC1HM-474	E CAPACITOR	0.47μF, 50V
	C29	QCBB1HJ-910	CAPACITOR	91pF, 50V
	L1	PU59152-R22K	COIL	0.22μH
	L2	PU59152-6R8K	COIL	6.8μH
	L4	PU59152-1R0K	COIL	1μH
	L5	PU59152-100J	COIL	10μH
	L7	PU59152-2R7K	COIL	2.7μH
	L9	PU59152-5R6J	COIL	5.6μH
		or PU59988-5R6JL	COIL	5.6μH
	HD1	PU36416-1-3	HOLDER	
	CN1	PU58844-6	CAP HOUSING	
	CN2	PU59555-8	CAP HOUSING	
	CN3	PU58844-5	CAP HOUSING	
⚠	CP1	ICP-F10	CIRCUIT PROTECTOR	

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AUDIO BOARD ASSEMBLY <09>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
⚠	PWBA	PB20390A-01	AUDIO BOARD ASSEMBLY	
	IC1	AN3380NK	IC	
	IC2	TA7361AP	IC	
	IC3	PB20167A-01	FMA MODULE BOARD ASSY	
	Q1	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q2	2SC1740S(Q)	TRANSISTOR	
	Q3	DTC114ES	TRANSISTOR	
	Q4	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q5	DTC114ES	TRANSISTOR	
	Q6	DTC114ES	TRANSISTOR	
	Q7	DTC114ES	TRANSISTOR	
	Q8	DTA114ES	TRANSISTOR	
	Q9	DTA114ES	TRANSISTOR	
	Q11	2SD1450S,T	TRANSISTOR	
	Q12	DTC143TS	TRANSISTOR	
	Q13	DTC143TS	TRANSISTOR	
	Q16	2SC1740S(Q)	TRANSISTOR	
	Q17	DTA114ES	TRANSISTOR	
	Q22	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q101	2SD1468S(RS)	TRANSISTOR	
	Q102	2SA854S(QR)	TRANSISTOR	
	D3	1SS133	DIODE	
		or MA165	DIODE	
	D4	1SS133	DIODE	
		or MA165	DIODE	
	D7	1SS133	DIODE	
		or MA165	DIODE	
	D8	1SS133	DIODE	
		or MA165	DIODE	
	D9	HZ2BLL	ZENER DIODE	
	D12	1SS133	DIODE	
		or MA165	DIODE	
	D21	1SS133	DIODE	
		or MA165	DIODE	
	R1	QRD161J-221	RESISTOR	220, 1/6W
	R3	QRD161J-102	RESISTOR	1.0K, 1/6W
	R4	QRD161J-682	RESISTOR	6.8K, 1/6W
	R5	QRD161J-271	RESISTOR	270, 1/6W
	R6	QRD161J-152	RESISTOR	1.5K, 1/6W
	R7	QRD161J-182	RESISTOR	1.8K, 1/6W
	R8	QRD161J-100	RESISTOR	10, 1/6W
	R9	QVZ3523-473AZ	V RESISTOR,BIAS ADJ	47K
		or QVZ3518-473AZ	V RESISTOR	47K
	R10	QRD161J-333	RESISTOR	33K, 1/6W
	R11	QRD161J-473	RESISTOR	47K, 1/6W
	R12	QRD161J-101	RESISTOR	100, 1/6W
	R13	QRD161J-473	RESISTOR	47K, 1/6W
	R14	QRD161J-6R8	RESISTOR	6.8, 1/6W
	R15	QRD161J-103	RESISTOR	10K, 1/6W
	R18	QRD161J-153	RESISTOR	15K, 1/6W
	R20	QRD161J-223	RESISTOR	22K, 1/6W
	R21	QRD161J-271	RESISTOR	270, 1/6W
	R22	QRD161J-151	RESISTOR	150, 1/6W
	R23	QRD161J-303	RESISTOR	30K, 1/6W
	R25	QRD161J-103	RESISTOR	10K, 1/6W
	R26	QRD161J-334	RESISTOR	330K, 1/6W
	R27	QRD161J-561	RESISTOR	560, 1/6W
	R29	QRD161J-102	RESISTOR	1.0K, 1/6W
	R31	QRD161J-151	RESISTOR	150, 1/6W
	R32	QRD161J-102	RESISTOR	1.0K, 1/6W
	R33	QRD161J-102	RESISTOR	1.0K, 1/6W
	R34	QRD161J-151	RESISTOR	150, 1/6W
	R40	QVZ3523-223AZ	V RESISTOR,EE LEVEL(L)	22K
		or QVZ3518-223AZ	V RESISTOR	22K
	R41	QVZ3523-223AZ	V RESISTOR,EE LEVEL(R)	22K
		or QVZ3518-223AZ	V RESISTOR	22K
	R42	QRD161J-243	RESISTOR	24K, 1/6W
	R43	QRD161J-101	RESISTOR	100, 1/6W
	R44	QRD161J-101	RESISTOR	100, 1/6W
	R45	QRD161J-392	RESISTOR	3.9K, 1/6W
	R46	QRD161J-332	RESISTOR	3.3K, 1/6W
	R47	QRD161J-153	RESISTOR	15K, 1/6W
	R48	QRD161J-223	RESISTOR	22K, 1/6W
	R49	QRD161J-274	RESISTOR	270K, 1/6W
	R50	QRD161J-222	RESISTOR	2.2K, 1/6W
	R51	QRD161J-222	RESISTOR	2.2K, 1/6W
	R52	QRD161J-103	RESISTOR	10K, 1/6W
	R53	QRD161J-333	RESISTOR	33K, 1/6W
	R54	QRD161J-223	RESISTOR	22K, 1/6W
	R55	QRD161J-363	RESISTOR	36K, 1/6W
	R58	QRD161J-333	RESISTOR	33K, 1/6W
	R59	QRD161J-333	RESISTOR	33K, 1/6W
	R60	QRD161J-333	RESISTOR	33K, 1/6W
	R61	QRD161J-272	RESISTOR	2.7K, 1/6W
	R62	QRD161J-333	RESISTOR	33K, 1/6W
	R63	QRD161J-102	RESISTOR	1.0K, 1/6W
	R64	QRD161J-331	RESISTOR	330, 1/6W
	R65	QRD161J-393	RESISTOR	39K, 1/6W
	R66	QRD161J-8R2	RESISTOR	8.2, 1/6W
	R67	QRD161J-103	RESISTOR	10K, 1/6W
	R68	QRD161J-472	RESISTOR	4.7K, 1/6W
	R69	QRD161J-390	RESISTOR	39, 1/6W
	R70	QRD161J-273	RESISTOR	27K, 1/6W
	R72	QRD161J-392	RESISTOR	3.9K, 1/6W
	R73	QVZ3523-332AZ	V RESISTOR,IND(L)	3.3K
		or QVZ3518-332AZ	V RESISTOR	3.3K
	R74	QVZ3523-332AZ	V RESISTOR,IND(R)	3.3K
		or QVZ3518-332AZ	V RESISTOR	3.3K
	R80	QRD161J-562	RESISTOR	5.6K, 1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R81	QRD161J-103	RESISTOR	10K, 1/6W
	R82	QRD161J-153	RESISTOR	15K, 1/6W
	R83	QRD161J-473	RESISTOR	47K, 1/6W
	R84	QRD161J-473	RESISTOR	47K, 1/6W
	R85	QRD161J-222	RESISTOR	2.2K, 1/6W
	R86	QRD161J-103	RESISTOR	10K, 1/6W
	R87	QRD161J-102	RESISTOR	1.0K, 1/6W
	R88	QRD161J-102	RESISTOR	1.0K, 1/6W
	R101	QRD161J-471	RESISTOR	470, 1/6W
	R103	QRD161J-103	RESISTOR	10K, 1/6W
	R104	QRD161J-222	RESISTOR	2.2K, 1/6W
	C1	QETC1CM-106	E CAPACITOR	10µF, 16V
	C2	QETC1AM-476	E CAPACITOR	47µF, 10V
	C3	QEP61CM-106	NP E CAPACITOR	10µF, 16V
	C4	QETC1CM-106	E CAPACITOR	10µF, 16V
	C5	QETC1CM-226	E CAPACITOR	22µF, 16V
	C6	QETC1AM-336	E CAPACITOR	33µF, 10V
	C7	QETC1AM-476	E CAPACITOR	47µF, 10V
	C8	QCBB1HJ-102	CAPACITOR	0.001µF, 50V
	C9	QCBB1HJ-101	CAPACITOR	100pF, 50V
	C10	QETC1AM-336	E CAPACITOR	33µF, 10V
	C11	QETC1AM-107	E CAPACITOR	100µF, 10V
	C12	QETC1CM-226	E CAPACITOR	22µF, 16V
	C13	QETC1CM-106	E CAPACITOR	10µF, 16V
	C14	QEP61CM-106	NP E CAPACITOR	10µF, 16V
	C15	QETC1AM-476	E CAPACITOR	47µF, 10V
	C16	QETC1CM-106	E CAPACITOR	10µF, 16V
	C17	QCBB1HJ-331	CAPACITOR	330pF, 50V
	C18	QFV71HJ-223	TF CAPACITOR	0.022µF, 50V
	C19	QFL31HJ-102	M CAPACITOR	0.001µF, 50V
	C20	QFL31HJ-102	M CAPACITOR	0.001µf, 50V
	C21	QETC1EM-475	E CAPACITOR	4.7µF, 25V
	C22	QETC1HM-334	E CAPACITOR	0.33µF, 50V
	C23	QCBB1HJ-331	CAPACITOR	330pF, 50V
	C24	QCBB1HJ-102	CAPACITOR	0.001µF, 50V
	C25	QETC1HM-225	E CAPACITOR	2.2µF, 50V
	C26	QETC1AM-336	E CAPACITOR	33µF, 10V
	C27	QETC0JM-476	E CAPACITOR	47µF, 6.3V
	C28	QFV71HJ-563	TF CAPACITOR	0.056µF, 50V
	C29	QFV71HJ-273	TF CAPACITOR	0.027µF, 50V
	C30	QETC1CM-106	E CAPACITOR	10µF, 16V
	C32	QFV71HJ-103	TF CAPACITOR	0.01µF, 50V
	C33	QETC1HM-334	E CAPACITOR	0.33µF, 50V
	C34	QEB51CM-685	E CAPACITOR	6.8µF, 16V
	C35	QEB51HM-105	E CAPACITOR	1.0µF, 50V
	C36	QETC1CM-106	E CAPACITOR	10µF, 16V
	C37	QETC1AM-336	E CAPACITOR	33µF, 10V
	C38	QETC1CM-476	E CAPACITOR	47µF, 16V
	C39	QETC1AM-336	E CAPACITOR	33µF, 10V
	C40	QETC1CM-106	E CAPACITOR	10µF, 16V
	C41	QETC1CM-476	E CAPACITOR	47µF, 16V
	C42	QETC1CM-106	E CAPACITOR	10µF, 16V
	C43	QETC1CM-106	E CAPACITOR	10µF, 16V
	C44	QETC1CM-106	E CAPACITOR	10µF, 16V
	C45	QENC1CM-106	NP E CAPACITOR	10µF, 16V
	C46	QENC1CM-106	NP E CAPACITOR	10µF, 16V
	C47	QETC1HM-225	E CAPACITOR	2.2µF, 50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C48	QETC1HM-104	E CAPACITOR	0.1µF, 50V
	C49	QCF31HP-223	CAPACITOR	0.022µF, 50V
	C50	QFV71HJ-104	TF CAPACITOR	0.1µF, 50V
	C51	QFV71HJ-104	TF CAPACITOR	0.1µF, 50V
	C52	QFV71HJ-104	TF CAPACITOR	0.1µF, 50V
	C53	QCF31HP-223	CAPACITOR	0.022µF, 50V
	C54	QEK60JM-107	E CAPACITOR	100µF, 6.3V
	C55	QCVB1CM-103	CAPACITOR	0.01µF, 16V
	C56	QCBB1HJ-102	CAPACITOR	0.001µF, 50V
	C57	QCSB1HJ-330	CAPACITOR	33pF, 50V
	C58	QCBB1HJ-331	CAPACITOR	330pF, 50V
	C59	QCBB1HJ-102	CAPACITOR	0.001µF, 50V
	C60	QCVB1CM-103	CAPACITOR	0.01µF, 16V
	C61	QCBB1HJ-151	CAPACITOR	150pF, 50V
	C62	QCBB1HJ-821	CAPACITOR	820pF, 50V
	C63	QFL31HJ-222	M CAPACITOR	0.0022µF, 50V
	C67	QETC1CM-106	E CAPACITOR	10µF, 16V
	C68	QETC1HM-225	E CAPACITOR	2.2µF, 50V
	C69	QETC1HM-225	E CAPACITOR	2.2µF, 50V
	C72	QCBB1HJ-561	CAPACITOR	560pF, 50V
	C73	QCBB1HJ-561	CAPACITOR	560pF, 50V
	C74	QFL31HJ-102	M CAPACITOR	0.001µF, 50V
	C75	QFL31HJ-102	M CAPACITOR	0.001µF, 50V
	C76	QFV71HJ-333	TF CAPACITOR	0.033µF, 50V
	C77	QETC1CM-106	E CAPACITOR	10µF, 16V
	C78	QFV71HJ-104	TF CAPACITOR	0.1µF, 50V
	C79	QFV71HJ-273	TF CAPACITOR	0.027µF, 50V
	C80	QCBB1HJ-102	CAPACITOR	0.001µF, 50V
	C101	QETB1CM-227	E CAPACITOR	220µF, 16V
	C103	QEK61CM-476	E CAPACITOR	47µF, 16V
	L1	PU48530-331J	COIL	330µH
	L3	PU58308-682J	COIL	6.8µH
	L4	PU54223-221J	COIL	220µH
	L5	PU48530-101J	COIL	100µH
	BPF1	PU60610	BPF(1.4MHZ)	
	BPF2	PU60611	BPF(1.8MHZ)	
⚠	T1	PU60303	OSC TRANSFORMER	
⚠	T2	PU60304	OSC TRANSFORMER	
	HD1	PU58018-1-2	PWB HINGE	
	SLD1	PU59960	P/R AMP SHIELD1	
	SLD2	PU59961	P/R AMP SHIELD2	
	SLD3	PU59962	P/R AMP SHIELD3	
	SLD4	PQ43345-1-1	SHIELD PLATE	
	TP31	PU55774	TEST PIN,X6	
	CN1	PU58844-3	CAP HOUSING	
	CN2	PU59555-8	CAP HOUSING	
	CN3	PU59555-6	CAP HOUSING	
	CN5	PU58844-4	CAP HOUSING	
	CN6	PU58844-2	CAP HOUSING	
	CN7	PU58844-4	CAP HOUSING	
	CN8	PU59555-4	CAP HOUSING	
	CN9	PU59555-4	CAP HOUSING	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	CN10	PU59555-5	CAP HOUSING
	CN11	PU58844-2	CAP HOUSING
	CN12	PU59555-6	CAP HOUSING
	CN13	PU59555-4	CAP HOUSING
	CN15	PU59555-2	CAP HOUSING
	CP1	ICP-F10	CIRCUIT PROTECTOR

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AUDIO CONTROL HEAD BOARD <12>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB40046-01-02	A/C HEAD BOARD
	CN1	PU58844-104	CAP HOUSING
	CN2	PU58844-103	CAP HOUSING

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DEMODULATOR BOARD ASSY <14>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20240D	DEMODULATOR BOARD ASSEMBLY	
	IC1	TDA3800GS	IC	
	Q1	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q2	2SD1292(QR)	TRANSISTOR	
		or 2SC3068	TRANSISTOR	
	Q3	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q4	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q5	DTC114ES	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
		or UN4211	TRANSISTOR	
	Q6	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q7	DTC114ES	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
		or UN4211	TRANSISTOR	
	Q8	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q9	2SD1450S,T	TRANSISTOR	
		or 2SD1292(QR)	TRANSISTOR	
	Q10	2SD1450S,T	TRANSISTOR	
		or 2SD1292(QR)	TRANSISTOR	
	Q11	DTA144ES	TRANSISTOR	
	Q12	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(G)-TJK	TRANSISTOR	
		or 2SC3311A(RS)	TRANSISTOR	
		or 2SC536SPA(FG)	TRANSISTOR	
	Q13	2SC1740S(RS)	TRANSISTOR	
		or 2SC3311A(RS)	TRANSISTOR	
		or 2SC3199(G)-TJK	TRANSISTOR	
		or 2SC536SPA(FG)	TRANSISTOR	
	D1	1SS133	DIODE	
	D2	1SS133	DIODE	
	D3	1SS133	DIODE	
	D4	1SS133	DIODE	
	D5	1SS133	DIODE	
	D6	1SS133	DIODE	
	R1	QRD161J-103	RESISTOR	10K, 1/6W
	R2	QVZ3518-103	V RESISTOR,SEPARATION ADJ	10K
	R3	QRD161J-153	RESISTOR	15K, 1/6W
	R4	QRD161J-331	RESISTOR	330, 1/6W
	R5	QRD161J-821	RESISTOR	820, 1/6W
	R6	QRD161J-102	RESISTOR	1.0K, 1/6W
	R7	QRD161J-104	RESISTOR	100K, 1/6W
	R8	QRD161J-154	RESISTOR	150K, 1/6W
	R9	QRD161J-271	RESISTOR	270, 1/6W
	R10	QRD161J-273	RESISTOR	27K, 1/6W
	R11	QRD161J-103	RESISTOR	10K, 1/6W
	R12	QRD161J-103	RESISTOR	10K, 1/6W
	R13	QRD161J-103	RESISTOR	10K, 1/6W
	R14	QRD161J-103	RESISTOR	10K, 1/6W
	R15	QRD161J-103	RESISTOR	10K, 1/6W
	R16	QRD161J-103	RESISTOR	10K, 1/6W
	R17	QRD161J-103	RESISTOR	10K, 1/6W
	R21	QVZ3518-332	V RESISTOR,L LEVEL	3.3K
	R22	QRD161J-222	RESISTOR	2.2K, 1/6W
	R23	QRD161J-103	RESISTOR	10K, 1/6W
	R24	QVZ3518-332	V RESISTOR,R LEVEL	3.3K
	R25	QRD161J-222	RESISTOR	2.2K, 1/6W
	R26	QRD161J-103	RESISTOR	10K, 1/6W
	R34	QRD161J-104	RESISTOR	100K, 1/6W
	R35	QRD161J-224	RESISTOR	220K, 1/6W
	R36	QRD161J-394	RESISTOR	390K, 1/6W
	R37	QRD161J-103	RESISTOR	10K, 1/6W
	C1	QETC1CM-106	E CAPACITOR	10μF, 16V
	C2	QFN31HK-392	M CAPACITOR	0.0039, 50V
	C3	QFN31HK-392	M CAPACITOR	0.0039, 50V
	C4	QFN31HK-392	M CAPACITOR	0.0039, 50V
	C5	QETC1CM-106	E CAPACITOR	10μF, 16V
	C6	QETC1CM-106	E CAPACITOR	10μF, 16V
	C7	QETC1CM-476	E CAPACITOR	47μF, 16V
	C8	QCF31HP-223	CAPACITOR	0.022μF, 50V
	C9	QCC11EK-473	CAPACITOR	0.047μF, 25V
	C10	QFP31HJ-102	M CAPACITOR	0.001μF, 50V
	C11	QETC1CM-477	E CAPACITOR	470μF, 16V
	C12	QCC11EK-473	CAPACITOR	0.047μF, 25V
	C13	QETC1CM-106	E CAPACITOR	10μF, 16V
	C14	QETC1CM-106	E CAPACITOR	10μF, 16V
	C15	QETC1CM-336	E CAPACITOR	33μF, 16V
	C16	QETC1CM-107	E CAPACITOR	100μF, 16V
	C17	QETC1HM-105	E CAPACITOR	1.0μF, 50V
	C18	QETC1CM-476	E CAPACITOR	47μF, 16V
	C20	QETC1CM-106	E CAPACITOR	10μF, 16V
	C22	QETC1CM-226	E CAPACITOR	22μF, 16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	BPF1	PU58226	BAND PASS FILTER
	CF1	PU52775	CERAMIC FILTER
	CF2	PU52775-2	CERAMIC FILTER
	T1	PU59489	COIL
	T2	PU59490	COIL
	CN1	PU58844-5	CAP HOUSING
	CN2	PU59555-4	CAP HOUSING
	CN3	PU59555-5	CAP HOUSING

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TIMER/DISPLAY/SW BOARD ASSY <20> <28>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10269A-01	T/D/S BOARD ASSY,EG	
		PB10269B-01	T/D/S BOARD ASSY,E	

— TIMER BOARD ASSEMBLY <20> —

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA1	PB10269B1	TIMER BOARD ASSY,E	
		PB10269A1	TIMER BOARD ASSY,EG	
	IC1	UPD75216ACW-293	IC	
		or UPD75P216ACW297	IC	
	IC2	IC-PST523H-2	IC	
	IC3	SDA5642	IC,EG	
	Q1	2SC3199(G)-TJK	TRANSISTOR	
		or 2SC3311A(RS)	TRANSISTOR	
	Q2	DTC124ES	TRANSISTOR	
	Q4	DTC144ES	TRANSISTOR	
	D1	RD9.1ESB2	ZENER DIODE	
	D2	1SS133	DIODE	
	D3	1SS133	DIODE	
	D4	11ES2	DIODE	
	D5	11ES2	DIODE	
	D27	1SS132	DIODE	
	R1	QRD161J-103	RESISTOR	10K, 1/6W
	R2	QRD161J-472	RESISTOR	4.7K, 1/6W
	R3	QRD161J-273	RESISTOR	27K, 1/6W
	R4	QRD161J-682	RESISTOR	6.8K, 1/6W
	R5	QRD161J-333	RESISTOR	33K, 1/6W
	R6	QRD161J-333	RESISTOR	33K, 1/6W
	R7	QRD161J-102	RESISTOR	1.0K, 1/6W
	R8	QRD161J-103	RESISTOR	10K, 1/6W
	R9	QRD161J-103	RESISTOR	10K, 1/6W
	R10	QRD161J-103	RESISTOR	10K, 1/6W
	R11	QRD161J-1	RESISTOR	10K, 1/6W
	R12	QRD161J-3	RESISTOR	33K, 1/6W
	R13	QRD161J-2	RESISTOR	270, 1/6W
	R14	QRD161J-27	RESISTOR	270, 1/6W
	R15	QRD161J-103	RESISTOR	10K, 1/6W
	R16	QRD161J-103	RESISTOR	10K, 1/6W
	R17	QRD161J-472	RESISTOR	4.7K, 1/6W
	R21	QRD161J-824	RESISTOR,EG	820K, 1/6W
	R22	QRD161J-101	RESISTOR,EG	100, 1/6W
	R23	QRD161J-562	RESISTOR,EG	5.6K, 1/6W
	R24	QRD161J-104	RESISTOR,EG	100K, 1/6W
	R25	QRD161J-103	RESISTOR	10K, 1/6W
	R26	QRD161J-103	RESISTOR	10K, 1/6W
	R27	QRD161J-105	RESISTOR,EG	1.0M, 1/6W
	R28	QRD161J-824	RESISTOR,EG	820K, 1/6W
	R29	QRD161J-202	RESISTOR,EG	2K, 1/6W
	R30	QRD161J-224	RESISTOR	220K, 1/6W
	R31	QRD161J-151	RESISTOR,E	150, 1/6W
	R32	QRD161J-271	RESISTOR	270, 1/6W
	R33	QRD161J-271	RESISTOR	270, 1/6W
	R34	QRD161J-271	RESISTOR,EG	270, 1/6W
	R35	QRD161J-271	RESISTOR,EG	270, 1/6W
	R36	QRD161J-103	RESISTOR	10K, 1/6W
	R37	QRD161J-104	RESISTOR	100K, 1/6W
	R38	QRD161J-104	RESISTOR	100K, 1/6W
	R39	QRD161J-104	RESISTOR	100K, 1/6W
	R40	QRD161J-103	RESISTOR	10K, 1/6W
	R41	QRD161J-103	RESISTOR	10K, 1/6W
	R42	QRD161J-103	RESISTOR	10K, 1/6W
	R43	QRD161J-104	RESISTOR	100K, 1/6W
	R44	QRD161J-104	RESISTOR	100K, 1/6W
	R45	QRD161J-472	RESISTOR	4.7K, 1/6W
	R47	QRD161J-102	RESISTOR	1.0K, 1/6W
	R48	QRD161J-102	RESISTOR	1.0K, 1/6W
	R49	QRD161J-103	RESISTOR	10K, 1/6W
	RA1	QRB047J-333	RESISTOR ARRAY	
		or QRB049J-333	RESISTOR ARRAY	
	RA2	QRB077J-104	RESISTOR ARRAY	
		or QRB079J-104	RESISTOR ARRAY	
	C3	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C4	QEK61CM-106	E CAPACITOR	10μF, 16V
	C5	QEA40HZ-104	E CAPACITOR (DOUBLE)	0.1μF, 5V
	C5	QEA40HZ-105	E CAPACITOR (DOUBLE)	1μF, 5V
	C6	PU57672-200	TRIMMER CAPACITOR,TIMER CLOCK	
	C7	QCSB1HJ-120	CAPACITOR	12pF,50V
	C8	QFN31HJ-103	M CAPACITOR,EG	0.01μF, 50V
	C9	QFN31HJ-333	M CAPACITOR,EG	0.033μF, 50V
	C10	QCVB1CN-103	CAPACITOR,EG	0.01μF, 16V
	C11	QEK61CM-106	E CAPACITOR	10μF, 16V
	C12	QCBB1HJ-151	CAPACITOR,EG	150pF, 16V
	C13	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C14	QEK61HM-106	E CAPACITOR	10μF, 50V
	C15	QCBB1HJ-101	CAPACITOR	100pF, 50V
	C16	QCBB1HJ-101	CAPACITOR	100pF, 50V
	C18	QEK61CM-106	E CAPACITOR	10μF, 16V
	C19	QEK61CM-106	E CAPACITOR	10μF, 16V
⚠	X1	PU60226-4	CRYSTAL RESONATOR	
	TP1	PU56008	TEST-PIN	
	CN1	PU59555-12	CAP HOUSING	
	CN2	PU58844-3	CAP HOUSING,E	
		PU58844-5	CAP HOUSING,EG	
⚠	CP1	ICP-F10	CIRCUIT PROTECTOR	

— SWITCH/DISPLAY BOARD ASSEMBLY <28> —

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA2	PB10269A2-01	SW/DISP BOARD ASSY,EG	
		PB10269B2-01	SW/DISP BOARD ASSY,E	
	IC101	GP1U521	INFRARED RAYS UNIT	
		or GP1U541X	INFRARED RAYS UNIT	
	IC102	MSC1195SS	IC	
	IC201	M50253P	IC	
	Q201	2SB643S	TRANSISTOR	
	D201	1SS132	DIODE	
	D202	1SS132	DIODE	
	D204	1SS132	DIODE	
	D205	1SS132	DIODE	
	D206	1SS132	DIODE	
	D207	1SS132	DIODE	
	D208	1SS132	DIODE	
	D209	SLR-34VC3F	LE DIODE,REC	
	D210	SLR-34MC3F	LE DIODE,PLAY	
	D211	SLR-34DC3F	LE DIODE,PAUSE	
	D212	SLR-34MC3F	LE DIODE,AUTO TRACK	
	D213	SLR-34VC3F	LE DIODE,AUDIO DUB	
	D214	SLR-34VC3F	LE DIODE,STEREO	
	D215	SLR-34MC3F	LE DIODE,A	
	D217	RD10ES-T1B2	ZENER DIODE	
		or UZ10BSB	ZENER DIODE	
	R108	QRD161J-103	RESISTOR	10K, 1/6W
	R109	QRD161J-103	RESISTOR	10K, 1/6W
	R110	QRD161J-103	RESISTOR	10K, 1/6W
	R111	QRD161J-103	RESISTOR	10K, 1/6W
	R113	QRD161J-103	RESISTOR	10K, 1/6W
	R116	QRD161J-103	RESISTOR	10K, 1/6W
	R201	QRD161J-271	RESISTOR	270, 1/6W
	R202	QRD161J-102	RESISTOR	1.0K, 1/6W
	R203	QRD161J-102	RESISTOR	1.0K, 1/6W
	R204	QRD161J-271	RESISTOR	270, 1/6W
	R205	QRD161J-271	RESISTOR	270, 1/6W
	R206	QRD161J-271	RESISTOR	270, 1/6W
	R207	QRD161J-271	RESISTOR	270, 1/6W
	R208	QRD161J-271	RESISTOR	270, 1/6W
	R209	QRD161J-103	RESISTOR	10K, 1/6W
	R210	QRD161J-103	RESISTOR	10K, 1/6W
	R211	QRD161J-472	RESISTOR	4.7K, 1/6W
	R212	QRD161J-822	RESISTOR	8.2K, 1/6W
	R213	QRD161J-271	RESISTOR	270, 1/6W
	R214	QRD161J-271	RESISTOR	270, 1/6W
	R217	QRD161J-333	RESISTOR	33K, 1/6W
	R218	QRD161J-333	RESISTOR	33K, 1/6W
	R219	QRD161J-823	RESISTOR	82K, 1/6W
	R220	QRD161J-333	RESISTOR	33K, 1/6W
	C106	QER40JM-226	E CAPACITOR	22μF, 6.3V
	C107	QER40JM-226	E CAPACITOR	22μF, 6.3V
	C108	QER41CM-106	E CAPACITOR	10μF, 16V
	C109	QFJ41HJ-223	M CAPACITOR	0.022μF, 50V
	C110	QFJ41HJ-473	M CAPACITOR	0.047μF, 50V
	C111	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C112	QCVB1CN-103	CAPACITOR	0.01μF, 16V
	C113	QER41VM-226	E CAPACITOR	22μF, 35V
	C114	QETC0JM-337	E CAPACITOR	330μF, 6.3V
	C201	QCBB1HJ-102	CAPACITOR	0.001μF, 50V
	C202	QCBB1HJ-102	CAPACITOR	0.001μF, 50V
	C203	QER41CM-336	E CAPACITOR	33μF, 16V
	S2	PU60392-2Z	TACT SWITCH,STOP/EJECT	
	S3	PU60392-2Z	TACT SWITCH,FF	
	S4	PU60392-2Z	TACT SWITCH,REW	
	S5	PU60392-2Z	TACT SWITCH,AUDIO DUB	
	S6	PU60392-2Z	TACT SWITCH,REC/ITR	
	S7	PU60392-2Z	TACT SWITCH,PLAY/X2	
	S8	PU60392-2Z	TACT SWITCH,PAUSE	
	S13	PU60392-2Z	TACT SWITCH,MIX	
	S14	PU60392-2Z	TACT SWITCH,AUDIO MONITOR	
	S18	PU60392-2Z	TACT SWITCH,CLOCK/PROGRAM	
	S19	PU60392-2Z	TACT SWITCH,START	
	S20	PU60392-2Z	TACT SWITCH,SC	
	S21	PU60392-2Z	TACT SWITCH,CANCEL/SKIP/RST	
	S22	PU60392-2Z	TACT SW,REPEAT/STORE/C.MEM	
	S23	PU60392-2Z	TACT SW,SEL/SUMMER TIME ADJ	
	S24	PU60392-2Z	TACT SWITCH,TIMER	
	S25	PU60392-2Z	TACT SWITCH,SET+/TRACK−	
	S26	PU60392-2Z	TACT SWITCH,SET+/TRACK−	
	S27	PU60392-2Z	TACT SWITCH,SP/LP	
	S29	PU60392-2Z	TACT SWITCH,CH SEARCH	
	S30	PU60392-2Z	TACT SWITCH,CH SET/VPS	
	S49	PU60392-2Z	TACT SWITCH,CH+	
	S50	PU60392-2Z	TACT SWITCH,CH−	
	S402	PU58486-1-1	SLIDE SWITCH,MAIN/SUB	
	S403	PU58486-1-1	SLIDE SW,AUTO/FORCED MONO	
	S404	PU58486-1-1	SLIDE SWITCH,AC ON LINE	
	FDP1	PU60970-2	FLUORESCENT DISPLAY PANEL,EG	
	FDP1	PU60970	FLUORESCENT DISPLAY PANEL,E	
	CL1	PU59311-4	WIRE CLAMP	
	CL2	PU59311-3	WIRE CLAMP	
	HD1	PQM30038-1-2	LED HOLDER,X7	
	HD2	PQ31355-1-2	FDP HOLDER(R)	
	HD3	PQ31356-1-2	FDP HOLDER(L)	
	J1	PW30101-40AAZZC	PARALLEL WIRE	
		or PW30115-40AAZZC	PARALLEL WIRE	
	J2	PW30101-40AAZZC	PARALLEL WIRE	
		or PW30115-40AAZZC	PARALLEL WIRE	
	J3	PW30101-40AAZZF	PARALLEL WIRE	
		or PW30115-40AAZZF	PARALLEL WIRE	
	SPC1	PU59210-002	W.LOKING SPACER	
	CN5	PU58844-7	CAP HOUSING	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	CN7	PU59555-5	CAP HOUSING	
	CN9	PU58844-6	CAP HOUSING	
	CN10	PU58844-2	CAP HOUSING	

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JACK BOARD ASSEMBLY <36>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20377A-01	JACK BOARD ASSY	
	R5,R6	PU61128	SLIDE VR,REC LEVEL	
	D1	SLH-34VC3F	LE DIODE,POWER	
	R1	PU61126	V RESISTOR,MIC	
	R2	QRD162J-103	RESISTOR	10K, 1/6W
	R3	PU61016	V RESISTOR,HEAD PHONE	
	R4	PU61127	V RESISTOR,P.SHARPNESS	
	LC1	PU59885-223	N FILTER	
	LC2	PU59885-223	N FILTER	
	S1	PU53598-2	TACT SWITCH,POWER	
	S2	PU58486-1-1	SLIDE SWITCH,ALC	
	K1	PU60281-5	FERRITE BEADS	
	CL1	PU59311	WIRE CLAMP	
	CL2	PU59311-2	WIRE CLAMP	
	HD1	PQM30038-1-2	LED HOLDER	
	J1	PU60664-4	MINI JACK,MIC	
	J2	PU60664-2	MINI JACK,HEADPHONE	
	CN1	PU59555-6	CAP HOUSING	
	CN2	PU59513-6	CAP HOUSING	
	CN3	PU59555-5	CAP HOUSING	
	CN4	PU58844-5	CAP HOUSING	

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UPPER DRUM BOARD <41>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PDM3207	BOARD (UPPER DRUM)	

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PRE/REC AMP BOARD ASSEMBLY <43>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10247G	PRE/REC BOARD ASSY	
	IC1	AN3386NK	IC	
	Q1	2SA1576(QRS)	TRANSISTOR	
	Q2	2SC4081	TRANSISTOR	
	Q3	2SC4081	TRANSISTOR	
	Q5	DTC144WU	TRANSISTOR	
	Q6	DTC144WU	TRANSISTOR	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D1	1SS1	DIODE	
		or MA165	DIODE	
	D2	MA141K	DIODE	
	D4	1SS133	DIODE	
		or MA165	DIODE	
	R1	QRSA08J-102YN	RESISTOR	1.0K, 1/10W
	R2	QRSA08J-222YN	RESISTOR	2.2K, 1/10W
	R3	QRSA08J-222YN	RESISTOR	2.2K, 1/10W
	R4	QRSA08J-391YN	RESISTOR	390, 1/10W
	R5	QRSA08J-391YN	RESISTOR	390, 1/10W
	R6	QRSA08J-821YN	RESISTOR	820, 1/10W
	R7	QRSA08J-222YN	RESISTOR	2.2K, 1/10W
	R8	QRSA08J-222YN	RESISTOR	2.2K, 1/10W
	R9	QRSA08J-681YN	RESISTOR	680, 1/10W
	R10	QRSA08J-821YN	RESISTOR	820, 1/10W
	R11	QRSA08J-122YN	RESISTOR	1.2K, 1/10W
	R12	QRSA08J-471YN	RESISTOR	470, 1/10W
	R14	QRSA08J-122YN	RESISTOR	1.2K, 1/10W
	R15	QRSA08J-562YN	RESISTOR	5.6K, 1/10W
	R16	QRSA08J-153YN	RESISTOR	15K, 1/10W
	R17	QRSA08J-562YN	RESISTOR	5.6K, 1/10W
	R18	QRSA08J-562YN	RESISTOR	5.6K, 1/10W
	R20	QRSA08J-103YN	RESISTOR	10K, 1/10W
	R21	QRSA08J-393YN	RESISTOR	39K, 1/10W
	R22	QRSA08J-153YN	RESISTOR	15K, 1/10W
	R23	QRSA08F-563YN	RESISTOR	56K, 1/10W
	R24	QRSA08J-184YN	RESISTOR	180K, 1/10W
	R25	QRSA08J-562YN	RESISTOR	5.6K, 1/10W
	R26	QRSA08J-271YN	RESISTOR	270, 1/10W
	R28	QRSA08J-271YN	RESISTOR	270, 1/10W
	R29	QRSA08J-271YN	RESISTOR	270, 1/10W
	R30	QRSA08J-104YN	RESISTOR	100K, 1/10W
	R31	QRD161J-474	RESISTOR	470K, 1/6W
	R41	QRD161J-0R0	RESISTOR	0, 1/6W
	C1	QER60JM-476	E CAPACITOR	47μF, 6.3V
	C2	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C3	QCSA1HJ-681	CAPACITOR	680pF, 50V
	C4	QCSB1HJ-150	CAPACITOR	15pF, 50V
	C5	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C7	QCSA1HJ-270	CAPACITOR	27pF, 50V
	C8	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C9	QCSA1HJ-910	CAPACITOR	91pF, 50V
	C10	QCSA1HJ-471	CAPACITOR	470pF, 50V
	C11	QCSA1HJ-390	CAPACITOR	39pF, 50V
	C12	QCSA1HJ-680	CAPACITOR	68pF, 50V
	C13	QCFA1EZ-104	CAPACITOR	0.1μF, 25V
	C15	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C16	QER60JM-476	E CAPACITOR	47μF, 6.3V
	C17	QCFA1HZ-333	CAPACITOR	0.033μF, 50V
	C18	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C19	QCFA1EZ-104	CAPACITOR	0.1μF, 25V
	C20	QCSA1HJ-101	CAPACITOR	100pF, 50V
	C21	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C22	QCSA1HJ-101	CAPACITOR	100pF, 50V
	C23	QCSA1HJ-101	CAPACITOR	100pF, 50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C24	QCY81EK-104	CAPACITOR	0.1μF, 25V
	C26	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C27	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C28	QCY81EK-104	CAPACITOR	0.1μF, 25V
	C29	QCY81EK-104	CAPACITOR	0.1μF, 25V
	C30	QER61AM-685	E CAPACITOR	6.8μF, 10V
	C31	QCF81EZ-224	CAPACITOR	0.22μF, 25V
	C32	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C33	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
	C38	QCSA1HJ-2R0	CAPACITOR	2pF, 50V
⚠	L1	PU54223-101K	COIL	100μH
	L2	PU59152-560J	COIL	56μH
	L3	PU59152-220J	COIL	22μH
	L4	PU59152-560J	COIL	56μH
	L5	PU59152-470J	COIL	47μH
	L6	PU59152-121J	COIL	120μH
	L7	PU59152-220J	COIL	22μH
⚠	L8	PU54223-470K	COIL	47μH
	SLD1	PQ32216-1-1	SHIELD CASE(1)	
	CN1	PU58844-106	CAP HOUSING	
	CN2	PU59555-106	CAP HOUSING	
	CN3	PU58844-104	CAP HOUSING	
	CN4	PU59974-11	CAP HOUSING	

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DECK TERMINAL BOARD ASSEMBLY <51>

	PWBA	PB10141C	DECK TERMINAL BOARD ASSY	
	PWBA1	PB10141C1	DECK TERMINAL BOARD ASSY	
	Q1	PU60625	END SENSOR	
	R1	QRD161J-102	RESISTOR	1.0K, 1/6W
	R2	QRD161J-123	RESISTOR	12K, 1/6W
	R3	QRD161J-331	RESISTOR	330, 1/6W
	R4	QRD161J-331	RESISTOR	330, 1/6W
	C1	QCVB1CM-103	CAPACITOR	0.01μF, 16V
	C2	QCFB1EZ-223	CAPACITOR	0.022μF, 25V
	PHS1	PU60623	REEL SENSOR, (PS1)	
	CN1	PU59933-14	WIRE TRAP	
	CN2	PU60642	CONNECTOR	
	CN3	PU60640	CONNECTOR	

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LOADING MDA BOARD ASSEMBLY <55>

	PWBA2	PB10141C2	LOADING MDA BOARD ASSY	
⚠	IC1	BA6418N	IC	
	C1	QETC1CM-476	E CAPACITOR	47μF, 16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C3	QFN31HJ-223	M CAPACITOR	0.022μF, 50V
	CN1	PU59555-104	CAP HOUSING	
	CN2	PU58844-102	CAP HOUSING	

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CASSETTE HOUSING BOARD <56>

	PWBA	PB40041-01-01	CASS.HOUSING BOARD	
	Q2	PN268VI-NC	PHOTO TRANSISTOR	
	C1	QCC11EJ-103	CAPACITOR	0.01μF, 25V
	PHS3	PU60629	CASS.SENSOR,(PS3)	
	CN2	PU60639	4 PIN SOCKET	